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EXAMPLES

OF THE

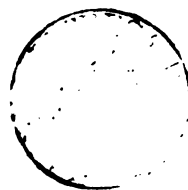
ARCHITECTURE OF THE VICTORIAN AGE,

AND

Monthly Review of the World's Architectural Progress.

"ART IS MORE GODLIKE THAN SCIENCE ; SCIENCE DISCOVERS, ART CREATES."

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EXAMPLES

OF

LONDON AND PROVINCIAL ARCHITECTURE

OF

THE VICTORIAN AGE.

OUR ADDRESS.



THE VICTORIAN AGE has its trophies everywhere. Art, science, literature, and war have all contributed to surround the beneficent reign of our beloved Queen with a halo of glory. The spirit of our times is thoughtful, truthful. Science is proceeding on experiment and actual observation; art is striving to be natural, and life earnest. In this regenerating national life Architecture participates; and although we have not much to record in the shape of progress, still, noble efforts are being made in every direction, and the most prejudiced must admit that those efforts have in many instances been crowned with success.

The author, the artist, and the architect are the three preachers to whom alone posterity has the privilege to listen. It is theirs to embody the thoughts, to catch the forms of beauty, and give perpetuity to the wisdom, taste, and skill of their age, and bequeath its culture as a precious legacy to future generations. They live not for one, but for all ages; and their achievements are the stars which guide humanity in its progress over life's troubled ocean.

Literature was the pioneer in the revival of culture which took place in Europe during the fifteenth century. It brought the moderns face to face with the great civilized nations of antiquity, and poets sung, and philosophers taught in tongues to them unknown, and in countries which they had never heard of. The body of ancient culture was dead, but its spirit lived again, and in Shakespeare and Bacon rivalled Homer and Plato.

Art also was awakened, but it has not as yet, except in painting, obtained any great results. Our sculptors of to-day are far below those of the age of Pericles.

Architecture was the last of the arts to yield to the flood of barbarism which swept over Europe during the Dark Ages. It struggled nobly with the debased current, and

showed a bright light where nearly all else was dark. Allying itself with the piety and devotion of the times, it gave expression to the devout aspirations of the Church, and has left its monuments everywhere, in cathedrals and churches whose ruins still excite our admiration from their surprising grandeur and traces of exquisite beauty.

Fifty years ago, architecture seems to have reached its lowest point of degradation. It was its darkest hour, and mud-spectres alone were visible when the dawn appeared, and that again happened which had previously taken place in literature. The voice of the fathers was again heard; they had spoken in every land, but no man seemed to regard them. Century after century had Westminster Abbey repeated its lessons of beauty, and with that noble pile before them, men had been content to build and admire the Law Courts opposite to it.

The first impulse was, naturally enough, to copy the great masters; this was a necessary, and, upon the whole, a good thing. Original thinkers, however, soon made their appearance in the field; and they, if they did little else, taught us to look for better things. To them nature was infinite and art inexhaustible. Hence they saw no reason why they also should not be original. To them every heroic age had expressed its highest aspirations in choice productions of architecture and art. Assyrian art was a reflex of Assyrian nature; the temples and monuments of Egypt the product of Egyptian thought; and Grecian art so magnificent because it was a truthful embodiment of the intellect of that wonderful people. To those men England also had a national spirit to embody, and only waited for a man with sufficient genius to give it expression.

No nation in the world ever had such opportunities as ours for erecting noble buildings, both public and private. We are the richest nation in the universe, and money is freely spent upon every conceivable object. Let our architects produce good things, and there is plenty of money in England, and public and private spirit also, to erect them. We pay little attention, therefore, to the constant complaint about the limitation of expense. Those who cannot erect good buildings with

the millions which are yearly spent for that purpose, would fail if they had the wealth of the empire at their command. What our buildings require is, not size, but expression; not luxury, but thought. And a plating of gold and a coat of stucco would be alike ugly and meaningless, unless life has been imparted to them by the touch of genius.

It is our duty, however, to look for good things; we do not profess to create them, we are not even critics. It is ours to delineate that which is growing up around us; we select that which seems to us the best, and would gladly take better if we knew where to find it. But that which is shall be truthfully given; and by producing the building in colours, whatever beauty it possesses is sure to be displayed.

From what we have already said, it will be taken for granted that we have not fixed upon any style of architecture to which, by way of pre-eminence, we shall apply the term VICTORIAN. Posterity may, for aught we know, dignify some modern efforts by that name; but with this we have nothing to do. We shall represent the architecture of the VICTORIAN AGE as it is, keeping a good look-out for all that is excellent in taste, and specially adapted to the purpose for which it was erected.

Such, then, is our vocation; we are seeking for those trophies of architectural skill which shall give expression to the spirit of our times in its highest and noblest aspect, and that shall convey to posterity a just conception of our present national culture. This we shall record in such form and style as shall insure its preservation, and give to those who can never see the originals a correct idea of the best buildings of our time.

The illustrations in our present number are confined to the International Exhibition building, because of the world-wide interest which is necessarily excited by this stupendous undertaking. These International Exhibitions are a product of the Victorian Age, and we desired to represent it accurately as it appeared on the 1st May, 1862.

STUDIES OF MODERN ARCHITECTURE AT HOME AND ABROAD.

BY G. R. BURNELL, ESQ.

In one of his earlier works, Victor Hugo said very truly that "*quand on sait voir, on retrouve l'esprit d'un siècle, et la physionomie d'un roi, jusque dans un marteau de porte;*" and it is precisely this connexion between the inner soul of a nation, and the external expression of it in its works of art, which gives to the science of Archaeology its deepest interest. "The noblest study of mankind is" said to be "man;" and so every form in which he displays his heart of hearts must merit and repay the study of those who endeavour to ascertain the meaning of the various social phenomena which influence or characterize his history. And it is to be observed that the terms of the latter portion of the preceding sentence have not been used lightly; for the monumental arts of an age and of a nation have a strange action and reaction on the

people who examine them daily. Properly understood, then, the "sermons in stones" may enable us to supply many blanks in the written stories of past ages, and to revive the living pictures, perhaps long since effaced, of the thoughts, feelings, aspirations, and faith of nations only known in chronicle by their deeds of destruction. History, as we read it in books, is too often a mere record of deeds of war and violence; the power and energy of construction are to be divined from the monuments of an age or country.

It would far exceed the limits which could be allotted to the articles of a publication, such as is now presented to the students of art history, (as displayed in contemporaneous architecture,) were an attempt made to work out the preceding notions to their natural consequences, throughout the whole of the long period of man's tenancy of this "sepulchral clod." A careful comparison of the works in course of erection in the most important cities of the civilized world, or which have been completed within our own time, will, however, serve well to "point the moral" sought to be demonstrated; and indeed society has passed through such marked changes within the period which has elapsed since 1814, that the art history of that time may serve to elucidate many questions which would throw a reflex light on those which have gone before. The general diffusion of education, the improvement of the analytical process of investigation, the development of the means of intercommunication, the great strides made in manufacturing industry and commerce, and the thousand ways in which man has recently, in sober truth, "made fire, flood, and earth the vassals of his will," have produced results so startling that society has, in the last half-century, been more changed in all its external expressions than it had been in any previous two or three centuries. What is the moral to be learned from this restless, ceaseless striving after a perfection which recedes as we advance, and in the pursuit of which we find that the gain of to-day only opens up the want of the morrow? What are the prospects, what the dangers, hopes, and fears to be anticipated from the spirit now abroad? Is there "good in everything" going on around us, either for the moral or for the intellectual advancement of our race? and have late years furnished lessons for our guidance or for our warning? These are noble subjects for inquiry, and it is proposed in this and in some subsequent articles, if favourably received, to discuss the bearings of recent architectural and archaeological revolutions upon their solution.

The first inquiry which presents itself, is the one as to whether periods of excellence in art correspond with any peculiar conditions of social organization? for, to limit our observations for the present to the two leading nations of Western Europe, England and France, we may observe that within the last half-century, there have been three distinctly-marked phases in the history of architecture, corresponding rudely with the great political dates of 1814, 1830, and 1848. Of course, Architecture, in the two countries thus named, has assumed characteristics which are in the respective cases, "racy of the soil;" just as, during the period of the great Revival of classical art the

architectures of Florence, of Rome, and of Venice bore the impress of the respective states of society amongst which they arose; and as must always be the case when the rude materials employed, the atmospheric conditions, and the social organizations of nations, differ notably. But in spite of these local modifications, it is easy to perceive that every one of the great changes in the architectural expression of the two countries named, have borne a marked parallelism with the contemporary political events, the nature and extent of which it must be of interest to study.

Previously to 1814 the iron despotism of the Empire of the first Napoleon had effectually crushed everything like originality of thought in the French people, and had drilled the national mind into the uniformity of a camp. The architecture of his day bore indeed the physiognomy of the Emperor; and it was modelled upon so lifeless an imitation of Roman imperialism, that it is easy to understand the cry of the aspirers after freedom of thought who sighed, almost in despair, for the man "*qui les délivrerait de ces éternels Grecs et Romains.*" There was, however, a solid grandeur, a bold, simple, massive effect about such buildings as the Bourse, the Madeleine, the Arc de l'Etoile, l'Arc du Carrousel, la Colonne de la Place Vendôme, the Marché St. Germain, the Entrepôt des Vins, the Abattoirs of Paris, the Pont d'Jéna, &c., which must always preserve the buildings of this period from contempt, even if they should be regarded with dislike. They were stiff and affected, it is true, but they were not *little*, in any sense of the word. When Napoleon fell, however, and the Bourbons introduced the freedom of constitutional government, and when men's minds, (which had during the long wars of the Republic and of the Empire been concentrated in the great struggle for existence at first, and then for power,) could be turned to the cultivation of the arts of peace, a great change soon came over the spirit of the nation, which displayed itself in the altered character of its architecture; perhaps not quite so distinctly as it did in the arts of painting, sculpture, music, and in literature and philosophy, but still perceptibly so. The churches of Notre Dame de Lorette, of St. Vincent de Paul, the Chapelle Expiatoire de la Rue d'Anjou St. Honoré, the completion of the Chamber of Deputies, the commencement of the Palais du Quai d'Orsay, may be cited as illustrations of the public buildings of this period; but the private buildings of the principal towns of France display the tendencies of the architecture of the "Restauration" in a still more decided manner. There is to be found in those buildings erected shortly after the fall of the Empire, as it were, a spirit of revolt against the rigid rectilinear style which had prevailed during the days of the crowned soldier; and towards the end of the Restauration the love for mediæval art began to display itself simultaneously with the brilliant appearance of the romantic school of literature. The galleries Vero-Dodat, Choiseul, Colbert, des Panoramas, the theatres du Vaudeville, Ventadour, &c., may be considered to represent the former phase of French architecture; the reconstruction of the Maison de François 1^{er}, and the commencement of the Ecole des Beaux Arts, of

the second. But France had been so exhausted by the wars of the Empire, by the foreign occupation, and the perpetual struggles and contests of parties during the short period of the reigns of the returned Bourbons, that the results of the efforts then made to improve the state of architecture only became apparent after their successor had reduced society to something like order after the fearful outburst of demagogism of 1830.

During the same period (that is, between 1814 and 1830) architecture in England passed through the phase characterized in the beginning by the productions of Wyattville, Soane, and Nash, or of Jupp, Cockerill, senr., and Hardwick, senr.; and towards the end by Smirke, Inwood, Wilkins, Jorden, Bedford, Decimus Burton, B. Wyatt, Rickman, Britton, and Pugin, though the three last-named artists were rather archæologists than practical architects. The buildings of London, and indeed of England generally, were then as deficient in taste and artistic feeling as it is possible to imagine, externally, at least; and internally, more attention was paid to physical gratification, to comfort, than to anything like intellectual expression. Practically, we had long been excluded from all interchange of ideas with the rest of the world by the struggle we had sustained against the French Revolution; and having been victors in that struggle, we had fancied that others ought to learn from us, not we from them. Our arts, and our architecture in particular, at this period were intensely local in their feeling and mode of expression; and as our local peculiarities had become exaggerated through our isolation from the rest of the world, they led us to the adoption of a style of architecture for many years which can now only be looked back upon with feelings of shame and of regret. Buildings like the Custom House, the old parts of Buckingham Palace, the Law Courts of Westminster, Regent-street, the Regent's-park Terraces, the Pavilion at Brighton, &c., are now thought to be so intensely ugly that the only surprise we can feel is, that they should ever have been erected. Yet they were admired at the very same time that the gates at Park Corner, Covent Garden Theatre, the Post Office, St. Pancras Church, the churches in the Waterloo-road, at the corner of Kennington Common, the Lothbury corner of the Bank, &c., were in course of construction, and when the revival of mediæval art was beginning to make itself felt. It would really seem that during the great struggle of the Revolutionary wars all the energy of our nation had been turned to meeting the necessities of the contest; and that though our commerce, our manufactures, and our means of intercommunication had attracted the attention of our rulers, because they furnished the elements of material strength, the finer arts had been designedly neglected, as being likely to lower the moral tone of the nation. When peace came, the artistic feeling of England no longer existed; and the nation which had produced the Reynolds, Gainsboroughs, Chambers, Adams, Bacons, and Banks of the latter end of the eighteenth century, was content to admire the Wests, Fuselis, Wyattvilles, Soanes, Westmacotts, and Nollekins of the beginning of the nineteenth. The imitation of

pure Grecian architecture, which became fashionable about the end of the Regency, was, in its way, a vast stride towards a purer and nobler taste; but the reason why we thus adopted the severely beautiful style of the Ionian and Doric rectilinear forms, whilst they were rapidly passing out of fashion in other countries (for there *is* fashion in these things), must long remain a mystery. It is curious that the building materials we use, and the climatological conditions of England, are far from being so well adapted to the trabeated architecture of the Greeks, as are the fine building stones and the clearer atmosphere of France. Yet, in our case, we persisted for years in carrying out huge horizontal openings by the use of cement and bricks; whilst our neighbours turned by preference to the practice of Vignola and of the Italian architects of the end of the Risorgimento for models and instruction. The latter had, like all who sought their inspiration from the study of classical Roman art, adopted vaulted construction instead of the trabeated one; and we therefore find that the French architects of the "Restauration" had continued in the same course.

There are two important remarks to be made on the subject of the want of taste which characterized the English architecture of George IV.'s era, and of the dawn of the revival of Mediæval art throughout Europe. The first is, that it rarely happens that the nations which occupy distinguished places in the world's history as guides and rulers in political affairs, are at the same time remarkable for the excellence or the originality of their arts; and that, whenever one of those social revolutions occur by which the external characteristics of a nation are altered, it is heralded by a literary movement preceding the artistic one. The second is, that the change of taste, feelings, and opinions which accompany these revolutions (or *palingénèses*, as Ballanche calls them), only exhibit themselves in the art productions of the successors of the generation which immediately works out the moral problems on which those revolutions depend. Thus, the old Romans avowedly claimed credit to themselves for the possession of the power of conquering the world, whilst they admitted the superiority of the Greeks in the arts which refine and adorn life—or, as Virgil said—

Exeunt alii spirantia mollius æra,
Tu regere imperio populos, Romane, memento!

and the brilliant periods of the Medicean and of the Louis XIV. ages corresponded but too closely with the moral degradation of the nations amongst which they arose. Ampère also acutely remarks, that even modern Rome herself, at the period when her influence was the most decidedly moral, did not produce any great artists in her own district, but was compelled to seek her architects, painters, and sculptors at Florence, Urbino, Bologna, &c. Again, it was amongst the contemporaries of Boccaccio, Petrarca, Giotto, and Brunelleschi that the movement in favour of classical art and literature commenced, to be worked out by the Bramantes, Michael Angelos, Filicaias, and Bembo of a future generation; just as Sir W. Scott, Victor Hugo, Schlegel, Savigny, Pugin, Lenoir, Schinkel, Boissée, Manzoni, &c., the leaders of the intellectual

movement of the period between 1814 and 1830, paved the way for the technical revival of the Mediæval feeling of later dates. In both these cases, however, the literary and scientific revival preceded the artistic one; and the intellect of the age had assumed a marked tendency, men's minds had been resolutely turned towards certain idols for many years, ere the more material arts assumed the expression of the prevalent modes of thought. It would seem that it requires a longer time to discipline the faculties which are brought into play in the production of works of pictorial, sculptural, or monumental art, than it does to discipline the poetical or the philosophical faculties; and it actually did happen that the romantic school established its power and influence, carrying the European mind back to the study of the middle ages, several years before artists or architects dared to cast aside the traditions of the classical schools in which they had been educated. Between 1814 and 1830 the prevalent styles of art in France and in England differed but little from those of the antecedent period; but when the generation educated under the influence of the ideas fermenting, as it were, at that period, came upon the stage of active life, their hopes, aspirations, and day-dreams found vent in the productions of their hands. Some of the architects of the period above named did, it is true, attempt to adopt the *Gothic* style, as it was still called; these works at the present day are bitterly criticised by the students of archæological details, and, indeed, they were very ludicrous affairs in many instances; but they as often display the existence of the same description of sentiment—of the same mental idiosyncrasy—as the one which had inspired the middle ages themselves, when examined by those who can look beyond the character of a foliage decoration, or the profile of a moulding, into the deeper spirit of the inspiring genius of the whole of the respective monuments.

It is desirable to dwell upon these considerations, because there is a tendency at the present day to confound the ideas of national taste and of national prosperity, and to regard the refinement of the one as the necessary predecessor of the other. History would appear, however, to teach another lesson, and hitherto the nations which have turned to the excessive cultivation of their artistic fancies, have witnessed the decline of their moral virtues, and consequently of the elements of their power and political superiority. There *are* dangers in the excessive development of any order of faculties to which the students of fine arts, from the very nature of their pursuit, are especially exposed, on account of the imaginative character that pursuit is likely to foster. In the body of the nation itself, when the arts are more than usually cultivated, somewhat of the same phenomenon occurs, and the refinement and luxury thus expressed lead to a morbid and effeminate delicacy of thought and feeling directly opposed to the manlier and higher order of mental character. The state of English and French architecture in the respective periods between 1800 and 1814, and of 1814 and 1830, seem to illustrate, in a partial manner, these views; and decidedly inferior as our schools of Architecture then were to those of our neighbours, it may fairly be ques-

tioned whether our very deficiencies were not indications of the prevalence of a healthier tone of the public mind than could be discerned in the more artistic productions of our neighbour. The buildings of the later period of the Georgian era were, no doubt, singularly devoid of taste, and they did not indicate any deep or sincere faith on the part of their authors; but in these respects they stood in marked contrast with the productions of the followers of other arts and sciences of their day; and thus must be considered to mark simply a transition state in their own particular walk. It could not be, that the epoch and nation which could boast of such men as Playfair, Dugald Stewart, Reid, Byron, Shelley, Wordsworth, Southey, Coleridge, Lamb, Flaxman, Turner (in his best day), Wedgwood, Rennie, Telford, Dodd, D. Stevenson, Watt (at the close of his career), Olynthus Gregory, Tredgold, F. Bailey, Ivory, Sir H. Davy, was in any way inferior to other times or nations "in the weightier matters" of life; and even the strange vagaries of the Pavilion, of All Souls', Langham-place, and the questionable repairs of our cathedrals, indicated that a profound movement was then going on in the national mind, which has paved the way to much of the improvement of more modern times.

At the present day we are apt to treat with ingratitude the services rendered to the cause of Architecture by the researches and the archaeological discoveries of the Restoration era; but a great portion of the credit awarded to the artists of subsequent times ought, in justice, to be awarded to those who collected—often at great personal risk—the elements of artistic education. Our own Aberdeen, Hope, Gell, Inwood, Wilkins, Cockerill, Donaldson, Pugin, Wyld, Britton, Daniel; the French Denon, Percier, Fontaine, Montigny, Clochat, Quatremère de Quincy, Raoul Rochette, Visconti, Dusommerard, Nodier, Merrimée, &c., had studied and reproduced the various forms of ancient art, and had called attention to those of the Middle Ages, of Egypt, and of India. The seed thus sown has yielded good fruit, but our debt of obligation to our predecessors is not the less great; and though the Architecture of the period between 1814 and 1830 did not produce any buildings able to characterize a "style," it rendered it easy for its successors to approach that desired consummation. In fine, this period was one of social and moral transition; for the conviction of the stability of old forms of law, philosophy, art, and even of religion, had been violently shaken by the events of the end of the seventeenth, and of the beginning of the eighteenth centuries; and men were anxiously examining the grave problems of man's destiny here and hereafter, and the mode of organizing society so as to allow him to work out that destiny in the freest and most satisfactory manner. The Architecture of the period reflected truly this state of the public mind. It was essentially uncertain and *tentative*. All previous styles were tried in their turns, and their merits discussed, but little originality was introduced into the works of the architectural students. Rousseau said, that "quand on commence à raisonner on cesse de sentir;" and so it seems to have happened with the architects of the Restoration epoch, and their productions are more remarkable for

learning than they are for fancy or for imagination, especially towards its close. At any rate the public monuments and the private constructions of this period indicate that a great problem was being worked out, and that the past and the future were arrayed face to face before thinking minds.

This was not the case only in the countries we have hitherto exclusively considered; for in the newly created kingdom of the Netherlands, and throughout Germany, the same uncertainty and the same evidence of aspirations after a more stable social organization may be discovered. It is true that the Dutch had subsided contentedly into the sleepy indifference which has so strangely characterized them of late years; but the Belgians were beginning to shake off the incubus of the French occupation, and of the deliberate exclusion from the commerce of the world to which they had formerly been condemned by the jealousy of their formidable rivals of the United Provinces; and Brussels, Ghent, Liege, Antwerp, were beginning again to adorn and improve their town architecture. In Germany, the signs of activity in this field were more distinctly marked still, and the schools of Vienna, Berlin, and Munich, were earnestly striving to eliminate a style of their own, under the guidance of such consummate artists as Schinkel, Von Klenz, Knoblauch, Von Gärtner, Ohlmüller, Von Hübsch, G. Moller, J. G. Müller, &c. In some respects, indeed, the German Architecture of the Restoration epoch must be considered to be of a far superior character to that of any of the contemporary European schools, for it was bolder, more distinctly national, and more fraught with promise for the future, than they were; yet even at this time the cold pedantry and the dreamy mysticism of the German intellect could be discerned in the architecture of the various capitals; and there is a lack of spontaneity about the marvellous adaptations of the forms of antecedent art, to be discovered in the Aukirche, the Glyptothek, the Theatre of Mainz, the Altlerchenfelder Kirche, &c., which goes far to mar their effect. Of late years, indeed, German art has been singularly "bureaucratic" in its spirit, and it bears ineffaceable signs of the personal influence of the rulers of the day, and of the tyranny of schools; self-dependence is not a German virtue, and it would be but lost labour to seek for its manifestation in German art. As for "the geographical expression," Italy, and as for Spain, there was so little national independence, and so little personal liberty in them during the period we have attempted to review, that they may safely be left out of account in the endeavour to discover the philosophy of architectural development.

SIR ROBERT CLIFTON'S BRIDGE OVER THE TRENT.—The plan of this structure, says the *Notts Guardian*, provides for every exigency which may arise from the flooding of the Trent. The incline at either side is erected on arches, which will arise from inverted arches, so that the impediment to the free passage of the water when it should rise above the usual level will be reduced considerably. The expense is estimated to be 24,000*l.* at the lowest. The Trent Navigation Company, it is stated, intend to oppose the passing of the Act, on the ground that the track for the horses under one of the large arches is not to be fenced in with iron railings.

WHAT IS ARCHITECTURE?

No. I.

BY T. HARRIS, ESQ.

ANY attempt to analyse or even criticise the merits of the architecture of this or any other age would be utterly futile unless we have some definite conception of what architecture really is; we shall therefore, as a preliminary to discussing what we conceive a VICTORIAN style should be, offer a few definitions that may serve as guides and limits in our future investigations.

Building, then, is not architecture, although the stones and bricks may be piled one upon another in enduring form. To merit the higher appellation there must not only be construction, but an arrangement of all the parts, and special adaptation of the whole to some individual or social want. In this there should be the utmost economy both of space and material. Still, something more is required. The artist must touch those lifeless blocks, and a presiding mind infuse his spirit into the whole until it expresses the very image of his soul, before it can be said to be pure architecture. This art, when properly understood, will differ from all the other fine arts, since they are only educational, whilst this is educational and useful, ministering to the necessities and luxuries of mankind, whilst it impresses the imagination with ideas of grandeur and educates the taste in lines of beauty.

In this art, then, there are several gradations, each possessing its own point of interest. Simple construction is sure to rivet the attention of the uninitiated. Arrangement is another gradation, more pleasing because more easily appreciated; then comes the artist who throws the halo of his genius over the whole and crowns the fabric with idealism and poetry. He gives life and vigour to the cold mass, and is the true creator of architecture. Before his time men lived in caves, wigwams, huts, and hovels. He stole the sacred fire from heaven, and breathed it into the dull masses of brick and stone. What the body, with its compact masses of bone, sinew, and muscles is without life, that is building without the higher inspirations of art.

Architecture should be—and, indeed, true architecture always is—the most intelligible and readable of all the fine arts. This must ever be the case when each work is complete in itself, not in a dead or foreign language, but in the correct vernacular of the period. When it speaks in a living and not in a dead language, it is read and understood by all men.

The study of ancient art is to us what the study of the classics is to the man of learning. We go to antiquity not for the purpose of reproducing what we find there, but that we may catch the spirit of refinement and power of expression possessed by the great artist of former days. Studied in this light, the monuments of ancient nations are invaluable. They are the chronicles which record the ebb and flow of human culture. In this way we can trace the wave of civilization as it passed from Asia to Europe, and mark the epochs of genius everywhere; but to articulate in the language of the ancients

is to speak in an unknown tongue, and fail to express the living thought of to-day. In every age except our own, architecture has been a faithful chronicler of the progress or decline of nations; but ours, which beyond all other is the age of progress, has not yet formed this expression of our present national culture in language in which we are content to convey it to posterity.

Upon architecture as distinguished from building, Mr. Ruskin has the following judicious remarks:—"To build—literally, to confirm—is by common understanding to put together, to adjust the several pieces of any edifice or receptacle of any size. Thus we have church building, house building, ship building, and coach building. That one edifice stands, another floats, and another is suspended on iron springs, makes no difference in the nature of the art, if so it may be called, of building or edification. The persons who profess that art are severally builders, ecclesiastical, naval, or of whatever other name their work may justify; but building does not become architecture merely by the stability of what it erects; and it is no more architecture which raises a church, or which fits it to receive and contain with comfort a required number of persons occupied in certain religious offices, than it is architecture which makes a carriage commodious or a ship swift. I do not, of course, mean that the word is not often, or even it may not be legitimately, applied in such a sense (as we speak of naval architecture); but in that sense architecture ceases to be one of the fine arts, and it is therefore better not to run the risk, by loose nomenclature, of the confusion which would arise, and has often arisen, from extending principles, which belong altogether to building, into the sphere of architecture proper.

"Let us, therefore, at once confine the name to that art which, taking up and admitting, as conditions of its working, the necessities and common uses of building, impresses on its form certain characters venerable or beautiful, but otherwise unnecessary. . . . It may not be always easy to draw the line so sharply and simply, because there are few buildings which have not some pretence or colour of being architectural, which is not based on good building; but it is perfectly easy, and very necessary, to keep the idea distinct, and to understand fully that architecture concerns itself only with those characters of an edifice which are above and beyond its common use. I say common, because a building raised to the honour of God, or in memory of men, has surely a use to which its architectural adornment fits it; but not a use which limits by any inevitable necessities its plan or details."

Such is Architecture according to our idea. In a future article we shall endeavour to show what the Victorian Architecture should be to realize this conception. There may, as indeed there always must be, a great difference between the real and the ideal. The poet in the high hour of his inspiration sees visions of beauty which his words but feebly express; and we also shall look for better things, although that which is reared around us in the shape of public and private building but faintly expresses the noble thoughts and feelings of the age in which it is our privilege to live.

PUBLIC MONUMENTS.

MONOLITHS.

THE erection of a national memorial to the late Prince Consort has forced upon all who take an interest in the matter a discussion of the question, What monument should be erected to a man whom a great nation delighteth to honour? Whether viewed in relation to art or universal history, this will always be a subject of great importance. We propose, therefore, to consider that suggested by Her Majesty, and very generally approved of—namely, a monolithic obelisk—in our present number, reserving other erections which have been devoted to a similar object for future treatment; for although the idea of raising a monolith to the Prince seems now to be definitely abandoned, still the obelisks of the world will always possess great interest to all who study the arts.

The erection of a national monument is an important event in the history of any country, since it fully expresses two important facts relative to the moral and intellectual culture of the age. The savage who worships brute force expresses in his mound or cairn his admiration for physical strength and courage, and being incapable of art, records his sentiment in rude grandeur. Civilized man, on the other hand, looks for other qualities in his hero, and gives expression to his thoughts in the choicest productions of art. Both, however, have one common object: to transmit to posterity a record of the man who, by some great service rendered to his own generation, has entailed a debt on posterity which the generations to come must pay in gratitude. It is hero-worship's highest act of devotion, and should be performed in the noblest and purest spirit of chivalry.

Every conceivable kind of object will put in its claim to commemorate a great man. One will have his column, another his equestrian statue, whilst every grade of philanthropy thinks its particular scheme the best calculated to do honour to the departed; hence we have memorial almshouses, schools, scholarships, churches, and hospitals, and every other form which public benevolence patronizes.

The object of erecting a monument at all is to express in some enduring manner our admiration of the great man who has just been taken from us, and we wish this record of ours to survive ourselves, and transmit his name and our affection to the latest generation. An enduring form therefore is not only necessary, but the most lasting, providing it satisfies the conditions of true art, should be selected. The world's experience is our best guide in this matter. The monolithic obelisks of Egypt have survived the language, the literature, and the very race that erected them. They not only told to the children of the Nile the names and history of the heroes in whose honour they were erected, but they are now, when the civilization in which they originated has utterly perished, repeating the same story in the cities of the west. The conqueror came and saw and coveted, and the Cæsars and Napoleon alike desired that their nations should possess those precious monuments erected by the artists of Egypt in memory of departed greatness.

In reality, an obelisk is the only unique and properly artistic or architectural memorial, with the single exception of a statue, that the united inventive faculty of mankind has yet been able to suggest. A column is simply out of place as a monument; on the contrary, an obelisk serves no other purpose. A column that supports nothing except a huge rat-trap like that at London-bridge, would be as inappropriate as a memorial of a great man, as the earth mound of the partially-civilized American. And almost every other kind of building is alike objectionable upon this same ground, that it is a perversion of its original significance. A hospital is an out-birth of philanthropy; a church, of devotion; and a gaol in memory of Howard, would be more appropriate than a Gothic building in honour of Prince Albert.

We regret that the Committee have abandoned the idea of erecting a monolith as a memorial to the late Prince Albert; for as we intend to do honour to his memory, it would have been well for once to have done something that would be worthy of our age, and that could not fail to be enduring. An obelisk cut from one piece of serpentine would, if not broken by barbarous violence, be fresh and perfect ten thousand years hence, and would tell those distant generations how much we loved and honoured "Albert the Good." It is, however, useless to regret; and all that is left to us is to enumerate those left by the great nations of antiquity, without hoping, at all events for the present, to produce anything of the kind ourselves.

We are indebted to the *Building News* for much that follows on the principal obelisks which still remain scattered amongst the ruins of Egypt, or which have been transported thence to European capitals.

"It is unnecessary that we should touch upon the question of their antiquity. We may take it for granted that they are 'Messalet Pharaum,' but whether Thothmes lived 1000 or 3000 years before Christ does not much affect our present purpose. Neither is it worth present inquiry, if Pliny's account be true, that Mitres, King of Egypt, was the originator of these monuments, and that they were first reared at Heliopolis, in honour of the Sun, which gave its name to the city. One phrase is, however, worth noting for its drollery. He speaks of Rameses 'pitching on end an obelisk,' which 'carried in length one hundred foot wanting one'—as though the feat were as easily performed as setting up a five-foot rod.

"Nearly all the Egyptian obelisks were set up in front of temples, one on either side of the doorway. The path leading thereto was, in many cases, an avenue of sphinxes, such as we see faithfully represented in the Egyptian Court at Sydenham. This accounts for the obelisks being in pairs. There are two, for instance, at Alexandria—the famous Cleopatra's needles, although what that queen had to do with them we cannot tell, nor can any one, it appears, inform us. They stood originally at Heliopolis, and were brought thence by the Ptolemies. Like the majority of the Egyptian obelisks, these are of the red Syene granite, and are somewhat less than ten diameters in height. One is still standing, the other lies prostrate by the side of it. It is this latter which was

on either side of the Egyptian gallery in the British Museum. They are of basalt, and covered with the most exquisite hieroglyphics.

"In an adjoining gallery we can see two obelisks from Assyria. The black one is the most important. It contains five panels of sculpture on each side, and the bands which divide, and the space below them, are covered with 1500 lines of Cuneiform inscriptions, detailing a history for thirty-one years of the empire. A larger one near it has its sculpture more defaced, and its inscriptions are illegible. It is cut from the ordinary limestone of the country. The peculiarity of both these monuments is not only in their sculpture, but in the termination of their apices. Whilst, in Egyptian examples, the tops are finished off in the form of a pyramid, these Assyrian ones are terminated by three steps or gradines, and are flat at the top.

"Another peculiar obelisk—a polygonal one—said to be Egyptian, stands before the cathedral at Catania in Sicily. It is fixed on the back of a carved elephant.

"In the Monumenta Danica we see an engraving of an obelisk, with a cross carved upon it, and we learn that similar ones have been found in several parts of Scandinavia. Of course they have nothing to do, except in their similarity of form, with the obelisks of Egypt.

"The grandeur seen in many of these obelisks springs chiefly from the sense of durability which they convey to the spectator, being chiefly hewed and squared out of the 'time-defying material,' granite, and consisting of monoliths of unusual size. The mere form of a small obelisk has but little beauty to recommend it. It was, nevertheless, a happy stroke of art which forbore carrying the tapering lines to a point, and splayed the sides of the summit pyramidally. The dignity of the obelisk is thus preserved, and its difference from a pyramid sufficiently marked. All obelisks have a greater or lesser family likeness, and all either were or were not intended to be what Strabo calls them—Books of History—covered on their four sides with inscriptions."

On the subject of monoliths, the Lord Mayor made some judicious remarks at the Mansion-house, on Wednesday, April 14th. In reply to a question from Mr. Gregson, his lordship said:—"He was afraid the great mass of the people of this country had yet to be educated, so to speak, into a thorough appreciation of the grandeur and appropriateness of the obelisk, and especially a monolithic obelisk, for monumental purposes. There were some who appeared to regard the setting up a huge stone for such a purpose as simply symbolical of a barbarous age. With great respect for the opinions of others, he could not help saying he altogether dissented from such reasoning. Besides, it was not until the Egyptians had reached the highest point in their cultivation of art that obelisks became conspicuous features in their style of architecture; and he thought it would have been a glorious thing for England, where a monolithic obelisk worthy the name was utterly unknown, to have made this the occasion for erecting one of imposing grandeur."

THE INTERNATIONAL EXHIBITION OF 1862.

BY CAPTAIN PHILLPOTTS.

ITS HISTORY.

THE promoters of the International Exhibition of 1861 intended that it should be the first of a series of similar Exhibitions; its brilliant success having confirmed them in this resolution, ten years was thought to be a convenient interval between each.

Accordingly, in 1858, the idea of an Exhibition, to be held in 1861, was brought forward, and being favourably received was resolved upon. The political state of Europe, however, compelled its postponement till 1862, and a Royal Commission for carrying it out was appointed at the commencement of last year.

The surplus funds of the 1851 Exhibition had been devoted to the purchase of a plot of ground on the Kensington-gore estate, which was intended to aid future International Exhibitions, and buildings for promoting industrial science and art. Twenty-two acres of this ground have been enclosed in a large quadrangle formed by arcades, and leased by the Commissioners of 1861 to the Royal Horticultural Society, to promote the objects of that institution.

In laying out the arcades, a large piece of ground was left at the south end, and the possibility of future Exhibitions not being lost sight of, they were so arranged as to make the remaining unoccupied space easily available for that object.

The southern portion of the arcades was built from the design of Captain Fowke, the engineer and architect to the department of science and art, who was one of a committee appointed to superintend the construction of the whole of the works on the estate of the Commissioners of 1861. From having been secretary to the British Department of the Paris Exhibition, in 1855, he had gained a clear insight into the nature of the building best adapted to a similar exhibition in England. Availing himself, therefore, of the experience thus gained, and acting under the conviction that periodical International Exhibitions would be established in England, he carefully considered the most appropriate design for a building on the ground adjoining the Royal Horticultural Society's Gardens. This design was matured while the arcades were in progress, and was therefore ready to be submitted to the Royal Commissioners as soon as they were appointed.

On the arrangements for the ground being completed, the Commissioners therefore had before them a design founded on large experience and an intimate knowledge of the site, the merits of which they at once recognised. Thus relieved of the necessity of competition, which, in the case of the 1851 Exhibition, resulted in disappointment and delay, they carefully considered Captain Fowke's plans, and eventually accepted them, subject, however, to some modification on account of the cost of their execution, which was estimated at 590,000*l*. The leading feature in the original design was the Great Hall, which was to have been 500 feet long, 250 feet wide, and 210 feet high. Its proposed position was immediately behind the central entrance of the south front, above which it would have towered in solitary grandeur. It was, however, suppressed on account of its cost; but there will be no architectural or constructive difficulties in adding the Great Hall subsequently, and it is to be hoped that before another Exhibition is held, sufficient funds for it may be available.

THE SITE.

The ground on which the main building stands is about sixteen acres in extent, and occupies the southern portion of the land purchased at South Kensington by the Commissioners for the Exhibition of 1861. Nearly rectangular in shape, it measures about 1200 feet from east to west, by 560 feet from north to south. It is immediately south of the Royal Horticultural Society's Gardens, the southern arcade of which has been lent to the Exhibition for refreshment rooms. The Cromwell-road forms the southern boundary, on the east it adjoins Exhibition-road, and on the west Prince Albert's-road.

The whole of this ground is covered by buildings of a permanent character, and to secure as much additional space as possible, the two long strips of ground between the east and west arcades and the adjacent roads are roofed in by means of temporary sheds, to give ample space for the exhibition of machinery and other ponderous objects which cannot be conveniently shown in the main building. The additional area afforded by these two annexes is about seven acres, which will make the total extent of the Exhibition twenty-four and a half acres.

The general level of the ground is from four to six feet below the adjoining roads, and it has a gentle slope from north-east to south-west. The nature of the soil is well adapted to building purposes; a bed of gravel, from four to twelve feet from the surface, extends



ROBERT DUDLEY DELT LITH

VINCENT HARRISON IMP.

INTERNATIONAL EXHIBITION, 1862

SOUTH OR PRINCIPAL ENTRANCE,
FROM THE CROMWELL ROAD.

DARTON & HODGE, LONDON.

throughout the whole area, so that a dry and firm foundation is easily obtained.

The Commissioners for 1851 are the legal proprietors of the site, but to secure the greater portion of it for the intended 1872 Exhibition, they have agreed to reserve about 16 acres for that purpose, on receiving 10,000*l.* as a sort of ground rent. To the Society of Arts will be granted the lease of the central portion of the Picture Gallery, one acre in extent, along the Cromwell-road, for 99 years, on condition that ground rent to the amount of 240*l.* per annum be paid to the 1851 Commissioners, it being understood that it will be given up unreservedly for the use of the 1872 Exhibition.

Unlike the 1851 Exhibition, therefore, the removal of which was compulsory, all that foresight could suggest has been done to retain the present buildings, and there can be no moral doubt that if, by any possible means, sufficient funds are available to meet the pecuniary liabilities, they will remain.

GENERAL DESCRIPTION.

In the general design of the building, its suitability for future International Exhibitions has been kept steadily in view, and it has a much more permanent character than the famous Crystal Palace erected for the 1851 Exhibition.

It differs, therefore, from its predecessor in many essential particulars. It is more commodious, more imposing in its interior, more varied, more suitable for exhibition purposes; while, from without, its aspect is of impressive magnitude and grandeur.

Here glass and iron are no longer the main features of the design, but are succeeded by lofty walls of brickwork, which surround the ground on all sides, and form the walls of the fine art galleries. The east end and west sides, by being continued past the southern arcade of the gardens, have a frontage of 750 feet, and that on the south 1150 feet. The north front is the lower arcade of the gardens, which has had a permanent upper story added to it. The interior space thus enclosed is entirely covered in by roofs of various heights, and is divided into nave, transepts, aisles, and open courts; the latter, occupying comparatively a very small portion, are roofed with glass as in 1851, but the other parts have opaque roofs, and are lighted by clerestory windows.

The interior supports are hollow cast-iron columns, as in 1851, of somewhat larger dimensions, being a foot wide, with half an inch of metal in them. They are so arranged as to come at intervals of 25 or 50 feet from centre to centre; in fact, 25 is the unit here, as 24 was in 1851, and nearly all the leading dimensions, both vertical and horizontal, are multiples of that number. The exceptions to this rule are the nave and transepts, which are 85 feet wide; the former runs east and west, and terminates in the centre of those fronts, having its central line 81 feet north of the centre line of the building, the latter extend north and south from the ends of the nave throughout the whole width. At the intersection of the nave and transepts are the great domes. The aisles are continued all round the nave and transepts, and the space enclosed by them forms the open of glass courts.

The columns are supported differently from what they were in 1851. On that occasion they were attached to connecting pieces, which, terminating in a large flat base plate, rested on concrete laid flush with the ground; these connecting pieces of course varied in height to suit the slope of the ground. This has been avoided in the present building, by bedding the columns themselves on York slabs laid on brick piers, which are founded on concrete; the slabs being all adjusted to the same level throughout, by varying the height of the brickwork, only one length of column is used, and the facility of setting them up is thus greatly increased.

At the north ends of the east and west fronts are the two annexes, temporary supplementary structures, designed for the exhibition of machinery and other ponderous objects, which could not be conveniently placed in the main building.

The total area roofed in is 988,000 square feet; it is therefore considerably larger than the 1851 Exhibition, which only occupied 799,000 square feet. It has also, when actual covered space is alone considered, slightly the advantage of the Paris Exhibition, which had a covered area of 953,000 square feet. But if we compare the total space, covered and uncovered, occupied by each, Paris is considerably larger, for the better suitability of its climate for out-of-door display enabled the authorities of that Exhibition to increase the area of ground given up to exhibiting space by 547,000 square feet; while, with our variable climate, it has not been thought advisable to have more than 35,000 feet of ground unroofed; so that the total areas, covered and uncovered,

occupied by the two Exhibitions, are 1,500,000 square feet for Paris, and 1,023,000 square feet for 1862.

The French Exhibition, therefore, considerably exceeded ours in size, but it was not nearly so compact in form, and its temporary annexes made up a very large portion of it, occupying 600,000 of the 953,000 square feet, while our two annexes do not amount to one-third of the total area.

CONTRACT.

Before going into a more detailed account of the various parts thus generally described, it is desirable to state the means which Her Majesty's Commissioners adopted for the punctual completion of the stupendous building. The plans were submitted to the competition of ten leading contractors; three tenders were sent in, and that furnished by Messrs. Kelk and Lucas being the lowest, was accepted.

These two most eminent firms, joining their resources together, have become partners for the work, and if one can judge from their antecedents, a better guarantee for punctuality and sound work could hardly have been obtained.

The nature of the contract is peculiar. The whole responsibility for the execution of the works rests with the contractors, and the amount they are to receive is contingent on the receipts of the Exhibition. The Commissioners have the option of purchasing the building out and out, or of merely paying for the use of it. For the rent of the building a sum of 200,000*l.* is guaranteed absolutely; if the receipts exceed 400,000*l.*, the contractors are to be paid 100,000*l.* more for rent, and they are bound, if required, to sell the whole for a further sum of 130,000*l.*, thus making its total cost 430,000*l.*

SOUTH FRONT.

The general outline of the south front presents an elevation of 1150 feet long and 55 feet high, in brickwork, with two projecting towers at each end, rising 16 feet above the general outline, and a large tower in the centre, which is to be the main entrance to the Picture Galleries. Semicircular-headed panels, separated by pilasters, are built at central intervals of 25 feet throughout the whole length, a high plinth extends all round, and between the arches are circular niches, at present vacant, but admitting of future decoration. In the lower portion of each panel is a window, to admit light and air to the ground-floor, and for ventilation of the Picture Gallery above.

The exterior is chiefly in plain brickwork, and with no more ornament than that work admits of. The panels are plastered in cement, and experiments are proposed to ornament them in English mosaics. The exterior decoration will eventually depend on the way in which this is carried out, to be decided as funds become available; the present Exhibition will be quite incomplete in this respect, but any amount of architectural ornament that can be paid for may be added hereafter. Yet in spite of this want of ornament, the author of the design has succeeded, with comparatively very limited means, in producing a very imposing general effect.

Those who have become acquainted with the leading features of the Exhibition building, chiefly through the earliest published drawings, will perhaps be surprised at a description of the south, or principal front, without reference being made to the great domes, which, according to those drawings, form an important feature in it. But the fact is that these domes, being 300 feet from this front, can never in any way enter into its effect; so far from it, indeed, that from no possible position can they ever be seen at the same time as part of the general front. The error has evidently arisen from the circumstance of the drawings in question having been made up by persons ignorant of the plan of the building, from geometric elevations, in which, of course, the domes appeared as if they belonged to the south front. We are induced to allude to this from the fact that much hostile criticism has been wasted upon the disastrous effect of the domes, as seen from positions from which they are really invisible. Each dome keeps its place as the centre of its own front, and its effect is utterly independent of its fellow, which is 1000 feet from it. To this want of comprehension of the subject may be attributed the feeling that has been expressed against the two domes adopted, and in favour of a central one. It will be seen, on a little reflection, that each of the domes is virtually central in its own composition, while a dome in the centre of the whole building would (from the vast extent of the structure and its peculiar situation) have been thrown entirely out of sight on all sides but one, until seen from such a distance as to lose all connexion with the building in an architectural point of view. The upper terrace of the Horticultural Gardens is the only point from which such a dome would have been seen in connexion with the building, and this is also the only point from which the two present domes appear simultaneously; but

be so disposed, he may even indulge in ginger beer and lemonade; while the more generous liver will obtain anything he chooses to call for—from bitter ale to iced champagne.

Let us glance at the mental refreshment afforded: on ordinary days it will be the quiet contemplation of the fairy-like scene before him; here will the mind feast, while the eye wanders from the sloping green banks and verdurous alleys of the pleasure-gardens, studded with flowers basking in the sun, to where the great cascade—appropriate monument to the parent of all around—pours itself into its wide and glittering basin below. On the occasion of *fêtes*, the beauty of the scene will be still further increased by throngs of gaily dressed visitors to the gardens, and the enjoyment of it enhanced by the music provided for their entertainment.

Nor will the pleasure ever be clouded by thoughts of the possibility of these rooms being removed, for no matter what are the financial results of the Exhibition, they, at least, will remain after its close, and form part of the Horticultural Gardens.

NAVE AND TRANSEPTS.

Let us now begin our survey of the interior.

To commence with the nave and transepts, which are similar in all respects.

Entering by the east or west front the visitor rises two steps, which brings him to the level of the dais under each dome. From this point, six feet above the rest of the floor, he commands in one view the interior of the whole building. A very serious obstacle in the ground has been overcome by this arrangement. The roads surrounding the site are about 5 feet above the level of the ground on which the building stands. Had this contour been rigidly followed, the visitor would have had on entering at once to descend 5 feet.

This immediate descent would have been most inconvenient, and would have totally marred the otherwise imposing interior aspect of the building. Had the whole area been raised to suit the road level, it will be obvious that the cost would have been considerably increased. From the dais, three flights of steps 80 feet wide conduct the visitor into the nave and transept on either side. The nave is 800 feet long, 85 feet wide, and 100 feet high to the ridge of the roof.

The supports on either side consist of square and round iron columns, coupled together; the former carry the gallery roof, and the latter, advancing into the nave, receive the principals of the roof. These columns are 50 feet high, in two lengths of 25 feet each, and from their capitals spring the roof frames, which consist of three thicknesses of plank from 18" to 2' 6" deep, firmly nailed and bolted together, and so arranged that their ends break joint. The centre plank is 4" thick, and each of the outer ones is 3"; the lower edges are tangents to an imaginary semicircle, round which they form half of a nearly regular polygon. From the springing rise the posts of the clerestory windows, 25 feet high. The principal rafters of the roof-frames rise from the top of these posts, and are carried up, after passing a tangent to the extrados of the arch, to meet at the ridge in a point 25 feet above the top of the clerestory. The angles over the haunches and crown of the arch are firmly braced together, so as to reduce the thrust as much as possible.

The rib is repeated thirty times in the length of the nave, and from its graceful curve and elegant lightness it produces an extremely fine effect. Between every roof-principal is a clerestory light 25 feet high, consisting of three arches springing from intermediate mullions. The roof is covered with felt, on 1½-inch plank, which is laid diagonally, so as to brace the whole together. The nave is therefore entirely dependent for its light on the clerestory windows; this is found to be amply sufficient, and a substantial water-tight covering is thus ensured, having the advantage of obviating all chance of that unpleasant glare which the experience of 1851 proved to be unavoidable with a glass covering, while at the same time it will be cooler in summer and warmer in winter. The rain water from the roof is conducted, by means of gutters, down the columns supporting the ribs to drains laid under the ground floor, which carry it off to drains under the adjoining roads.

From each end of the nave, at right angles to it, and extending north and south for a length of 650 feet, run the transepts. They are the same width and height as the nave, and the ribs of its roof are of precisely the same construction.

The nave ribs have been made at Mr. Kelk's yard in Pimlico, and carted to the ground in four pieces. When on the spot ready for hoisting, they were formed into two pieces, so arranged that the point of junction should always be at the ridge. To fix the principals in the nave roof, a moveable scaffold of very clever design was used. It

contained 4740 cubic feet of timber, and weighed 87 tons; but notwithstanding this, it was moved by four men working crowbars under the wheels. One half of a rib was hoisted to its place; when in position, the other half was raised, and as soon as both were fixed true, they were joined together by completing the arch, and bracing over its crown. As soon as one rib was up, the travelling scaffold was moved to the adjoining bay, and the next rib completed. The purlins and boarding were then fixed, after which the scaffolding was again moved forward, and another bay covered in the same manner.

The hoisting was all done by a most ingenious winch, or hoist, worked by steam, the invention of Mr. Ashton. This machine has two grooved cast-iron barrels, which are made to revolve by means of a system of toothed wheels connected with a portable steam-engine. A rope is passed round the grooves. On the fall being manned, and the barrels set in motion, the coils of rope are gathered up, and a great hoisting power obtained. By means of snatch-blocks and pulleys, ropes are led from this beautifully simple machine to all parts of the building, and the heaviest materials, such as girders, columns, scaffold beams, &c., are hoisted to their position with the greatest ease and rapidity. As an instance, it need only be mentioned that the heavy floor girders, weighing about 1½ ton, were raised in two minutes, columns in about the same time, and the ponderous ribs of the nave, weighing 6½ tons, required only from ten to twenty minutes to raise them to their full height.

The ribs of the transept were fixed over a standing scaffold all through, which alone consumed 30,336 cubic feet of timber. The reason for this was that as the domes divide the transepts into four separate lengths, four travellers would have been necessary; and though these would not have taken nearly so much material as the standing scaffolds, yet the contractors thought that the difference would not have compensated for the additional labour required in building the former.

AISES, GALLERIES, AND STAIRS.

Three large divisions of the building higher than the adjoining portions run parallel through it from east to west; they are the Refreshment Rooms, the Nave, and the Picture Gallery. These are connected at their ends by transepts, and thus two vast oblong spaces are enclosed, one to the north and the other to the south of the nave.

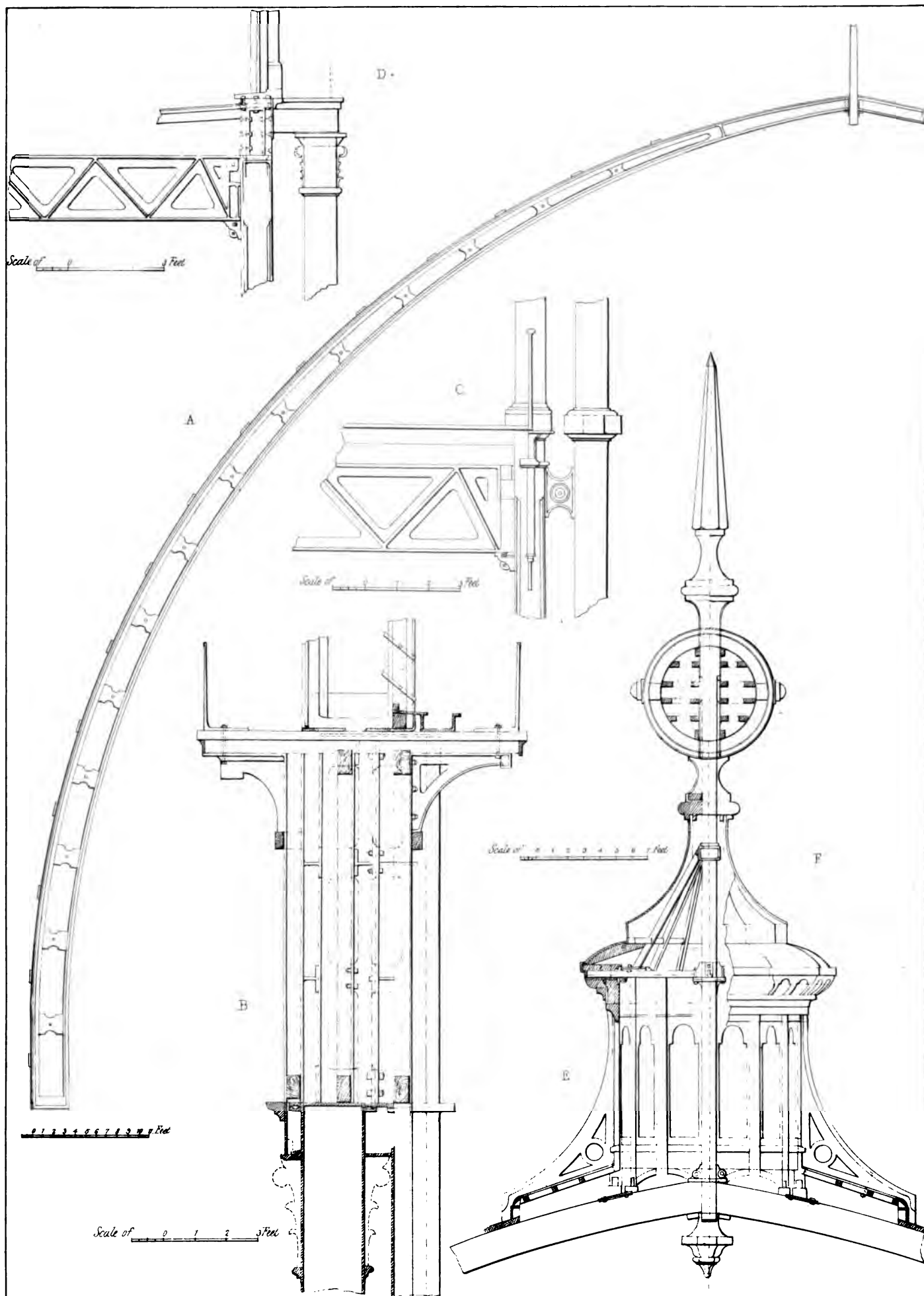
On both sides of the nave and the inner sides of the transepts are aisles 50 feet wide. Another aisle, 25 feet wide, is carried along the outer sides of the transepts and along the back wall of the south front.

After deducting the space occupied by all these aisles from the oblongs above referred to, we have remaining two smaller ones, that north of the nave 750 feet by 87, and that at the south of it 750 by 200 feet. Each of these is subdivided into three courts by two 50-foot aisles. The centre courts are 150 feet long, and those at the ends 250 feet. The dividing aisles on the north lead to the refreshment rooms, on the south to the entrance vestibule.

Twenty-five feet above the ground floor are the galleries, following the same line as the aisles; they give an additional exhibiting space of 203,000 square feet. Particular care has been taken to make these galleries amply strong for the heavy moving loads they will have to bear. The floors are supported on cast-iron girders fixed to the columns; over them are laid two strong suspended trusses, which carry the joists and boarding.

Supposing a floor to be loaded with 140 lbs. to the square foot, which, being more than the weight of a dense crowd of people, is heavier than any weight it can have to bear, the greatest load that can thus be placed on a girder is 34 tons. The breaking weight of the girders used is 88 tons, and every one of them was proved in a hydraulic press, specially constructed for the purpose, to a load of 38 tons, to avoid all risks of bad castings being used. Over each gallery is a flat roof covered with zinc, supported like the floor, but of much lighter construction. Sixteen flights of steps, 10 feet wide, give ample means of ascending from the ground to the upper floor.

The galleries play a very important part in the construction of the building; they are made to form an abutment to the nave and transept, and the particular form of bracing by which this is effected is the ingenious suggestion of Mr. Ordish. The roof thrusting outwards tends to throw the columns out of perpendicular; strong iron braces are therefore anchored to the foundation of the inner column, and carried up to the top of the opposite outer column, which are thus made to counteract the thrust of the roof. Another bracing, anchored to the footing of the outer column, is carried up to the top of the inner column, to secure it from being acted upon by the force of the wind. This vertical cross bracing is repeated at every 100 feet, or



ROBERT DUDLEY DEL. & ENTH

VINCENT BROOKS IMP

INTERNATIONAL EXHIBITION 1862.

CONSTRUCTIVE DETAILS

A ELEVATION OF THE MAIN RIBS OF DOME

B SECTION AT SPRING OF DOME

C SECTION AT LEVEL OF GALLERY FLOOR (NAVE & TRANSEPT)

D SECTION AT SPRING OF NAVE ARCHES & LEVEL OF GALLERY ROOFS

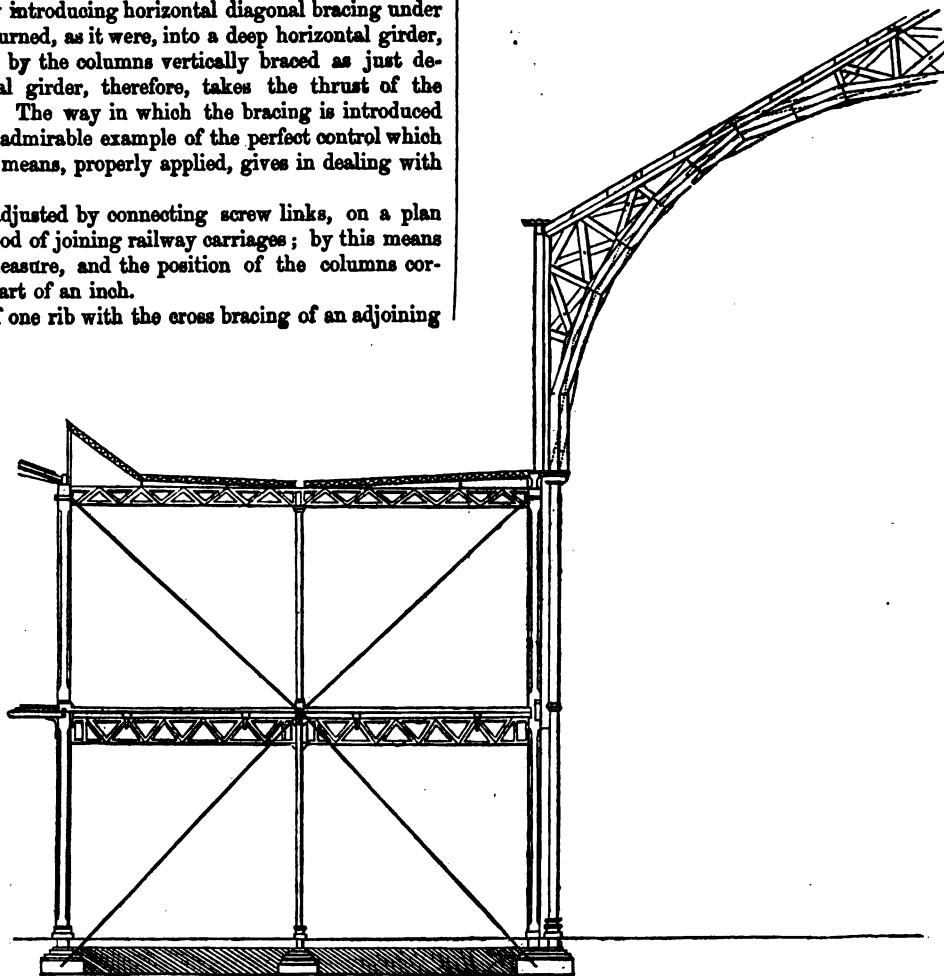
E SECTION OF LANTERN CROWNING THE DOME

F SMALL PORTION OF SAME SHOWING OUTSIDE ELEVATION (COMPLETED)

every fourth bay, and by introducing horizontal diagonal bracing under the roof flats, they are turned, as it were, into a deep horizontal girder, supported at both ends by the columns vertically braced as just described. This horizontal girder, therefore, takes the thrust of the three intervening ribs. The way in which the bracing is introduced is very clever, and is an admirable example of the perfect control which the simplest mechanical means, properly applied, gives in dealing with enormous masses.

The bracing is all adjusted by connecting screw links, on a plan very similar to the method of joining railway carriages; by this means it can be tightened at pleasure, and the position of the columns corrected to the minutest part of an inch.

The cut shows half of one rib with the cross bracing of an adjoining set of columns.



OPEN OR GLASS COURTS.

In describing the position of the aisles and galleries, it was explained how they enclose six courts, three north of the nave, two of which are 250 feet by 87 feet, and the other 150 by 87 feet; three south of the nave, two of which are 250 feet by 200 feet, and the other 150 feet by 200 feet. These form the open or glass-covered courts, and are the only portions of the building which in this particular resemble the Crystal Palace of 1851. They have only a ground-floor, and the roof, which is on the ridge-and-valley plan, but in spans of 50 feet, is entirely covered with glass. The roof is carried on square iron columns 50 feet apart each way, at the top of which, 50 feet above the floor, wrought-iron trellis girders are fixed on lines running east and west. The columns and trellis-girders carry the principals of the roof, which are all of iron, on the trussed rafter plan, 8 feet apart. The roofs are drained by channels in the valleys, conducting the water down the hollow iron columns. These courts, with their light glass roofs admitting floods of light into the building, give a pleasing variety to the interior, and afford most valuable exhibiting space.

DOMES AND GROINED RIBS.

We now come to the great domes, which, from their stupendous size, form one of the most prominent and interesting features in the building.

As before explained, they are situated at the intersection of the nave and transepts. Their form and position have been thus determined. The intersections of the lines of columns in the nave and transept-aisles form two octagons, which, though not mathematically regular, are regular in this one respect—their opposite sides are parallel and equal, the length of the sides being alternately 85 feet and 35 feet 5 inches. The points at the angles of these octagons are the chief supports of the domes. For this purpose there is a column at each angle 2 feet in diameter, and for architectural effect, as well as for carrying the groined ribs, the object of which shall be presently explained, the lower portions of these two-foot columns are clustered with two round and one square column of smaller dimensions.

But though the chief supports are at the eight angles of the octagon, the dome is a duodecagon, the other four points being thus

obtained. The last bay of the nave and transept, instead of having a roof resting on wooden principals going straight across, has two iron diagonal ribs crossing it, forming, as it were, a groined arch, whose apex is a point in the centre of the bay and in a line with the roof ridge. By joining the apices of these groins and the points in the octagon already determined, we get a nearly regular duodecagon, having its opposite sides parallel and equal, and with eight sides in pairs each equal to 43' 9", and four sides coming between these pairs, each equal to 35' 5". This duodecagon forms the base of the dome, which has thus eight sides over the nave and transepts, and four sides over the corners of the aisles, equal respectively to the dimensions just given, and a diameter of 160 feet.

Each groined rib transmits the weight on it to two columns outside the octagon, so that the dome may be said to rest on sixteen points, its pressure on the angles of the octagon being nearly five times ($4\frac{2}{3}$) as much as it is on the adjacent columns of the nave and transepts.

By the very ingenious and novel plan of the groined roof ribs, a duodecagon dome is made to seem to stand on an octagon; no additional columns of support but those actually coming in the sides of the nave and transepts are used, and thus an uninterrupted vista is obtained through both, and a very beautiful effect produced.

Each rib is two feet deep, with a web of $\frac{3}{4}$ in. boiler plate, to the edge of which is rivetted a top and bottom flange of angle-iron, in such a way as to give the top flange an area of $10\frac{1}{2}$ in., and the bottom flange an area of $19\frac{1}{2}$ in. The principal rafter and its upright are also made of wrought-iron, having a web 12 inches deep, with an equal top and bottom flange rivetted to it, so as to give it a sectional area of $20\frac{1}{2}$ in. Radial pieces of iron $8" \times \frac{3}{4}"$, connecting the upright and principal rafter with the curved portion of the rib, are introduced every 5 feet. At the intersections the ribs are strengthened by additional plates of iron, and here, for a short distance, they assume the form of a box girder.

At their intersections the principal rafters and the curved portions of the ribs are connected by a cast-iron standard, which is continued up above the ridge of the roof to a point 107 feet from the nave floor, this being the level of the bed on which the dome ribs rest.

The large columns at the angles of the octagon are 2 feet in ex-

ternal diameter, with $\frac{7}{8}$ ths of an inch of metal, and they are raised in three lengths to a height of 95 feet, their ends being joined together by flanges and screwed nuts on the inside. To fasten the bolts, a man had to be lowered down inside the columns, the diameter of which is just sufficient to give room to screw up the nuts. The columns are thus kept perfectly smooth on the outside, and appear like one casting 95 feet long. To the top of each 2 feet column is bolted a cast-iron stanchion 12 feet high, whose summit is therefore just 107 feet above the nave floor. On the tops of these stanchions, and resting on brackets, a gallery 3 feet wide is carried round the outside and inside of the drum. It is not, however, accessible to the public, but only serves as a means of access to the dome and to the louvres which are here placed for ventilation. To the upper side of the gallery, and through it to the stanchions, the double wrought-iron tie-plate, acting as the dome's hoop, is securely bolted. It consists of an inner plate of iron $6'' \times \frac{3}{8}''$, which is connected with an outer plate $10'' \times \frac{3}{8}''$, so that both these plates take the thrust of the dome. The dome ribs are bedded on the top of them, with their feet bolted through to the heads of the stanchions.

Each dome rib is an iron girder made of boiler plate and angle iron. The top and bottom flanges are nearly equal in section—the former being $19\frac{1}{2}$, the latter $20\frac{3}{4}$ square inches. There is no continuous web between the two flanges, but they are joined at 8 feet intervals by two pieces of boiler plate having a 3" wood spacing piece between. The first seven feet of each rib is vertical, and the girder is here $3\frac{1}{2}$ feet deep. At the summit of the vertical portion, which is 114 feet above the nave floor level, is the springing line. The top flange follows the curve traced by a radius of $91' 9\frac{3}{8}''$, the centre being a point $12' 3\frac{3}{8}''$ beyond the centre of the dome; the bottom flange forms a curve whose radius is $90' 1\frac{1}{2}''$, and centre $14' 0\frac{1}{2}''$ beyond the dome's centre.

The two flanges thus come nearer to each other as they approach the apex, where they are only two feet apart. This point is 91 feet above the springing line, and the ribs meet there, abutting against a cast-iron pipe, to which they are bolted.

Eight wrought-iron purlins between the springing and the apex are bolted to the ribs, and the two lower divisions thus formed are cross-braced, to make the whole as rigid as possible—the bracing being carried down to the points over the groins, so as to partially relieve them of the weight they would otherwise have to carry. The purlins are formed of two pieces of T-iron, joined together at 6-foot intervals by a half-inch plate. They vary in section, decreasing as they approach the summit; and those in the larger triangles are slightly heavier, on account of their longer bearing. The first purlin, of a large triangle, is $1' 8\frac{1}{8}''$ deep, and its T-iron flanges are $3\frac{1}{2}'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$. The upper purlin has a continuous web plate $10\frac{1}{2}''$ deep, with top and bottom flanges of L-iron, $2'' \times 2'' \times \frac{1}{4}''$.

These dimensions are altered in a small triangle, the depth of the lower purlin being $1' 8\frac{1}{8}''$, and the T-iron $3'' \times 3'' \times \frac{1}{2}''$; the upper purlin is here 11" deep, and the L-iron is the same as before. Wrought-iron sash-bars to carry the glass are rivetted to the purlins every eighteen inches, every fifth bar being made sufficiently heavy to assist in the cross bracing and prevent the purlins from twisting.

The crown of the dome, for about thirty-two feet down, has an ornamental zinc covering, but the whole of the remainder is glazed. From the apex rises the finial to a height of 60 feet, resting on a concave base, which, being ornamented with brackets, windows, and mouldings, is terminated by a globe surrounded by three great circles, from the top of which rises a gilded pinnacle.

Clerestory windows, on a level with those of the nave, are continued round the drum of the dome; panels above these reach to the gallery level, which has an iron railing all round.

These domes are the largest that have ever yet been executed. Their exterior diameter is 160 feet; the dome of St. Peter's is $157\frac{1}{4}$ feet, and that of St. Paul's 112 feet. But although the largest in every way that have yet been constructed, they will not rise to so great a height above the ground as those with which they have been compared. The Exhibition domes spring from a height of 114 feet, which makes the top of the finial 260 feet above the ground, while the cross on St. Peter's is 434 feet, and that of St. Paul's 340 feet above the pavement.

An account of the domes would be incomplete without some description of the scaffolds on which they were raised. These were literally forests of timber, occupying nearly the whole of the interior of the domes, cross-braced and bolted together in every possible way, so as to give them sufficient strength to bear the weight of iron in each dome, amounting to 120 tons.

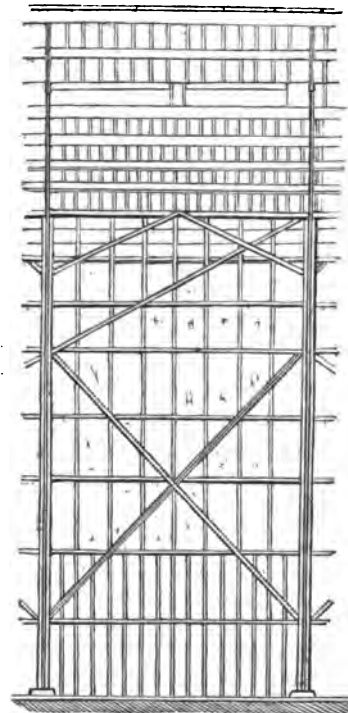
Each scaffold was carried up in eight different stages, with horizontal beams between; the central portion was a square of 24 feet, rising to a height of 200 feet, having each stage cross-braced vertically. From the centre radiated a scaffold into each triangle of the dome, to which it was in shape similar, though not quite so large. These radiating scaffolds had independent vertical bracing, while at each stage they were cross-braced horizontally, and connected with the central scaffold as well as with each other. The main timbers were from $14''$ to $12''$ square, and the cross braces averaged $12'' \times 6''$. This work was executed by Mr. Clemence, the contractors' clerk of works, and must be considered a *chef-d'œuvre* in scaffolding, being of immense strength, and so skilfully constructed, that very little of the timber was spoiled by cutting, so that when taken down every particle of wood used (amounting to 40,672 cubic feet in each scaffold) was as available for any other work, as if it had just come from the builder's yard. They were completed in eight weeks, and every beam in them was hoisted by the steam winch already described, without the aid of which they would have required at least double the time, and been far more costly to execute.

THE ANNEXES.

Having now gone through the various portions of the permanent buildings, let us proceed to the Annexes or temporary buildings adjoining the Exhibition.

The plan of having detached buildings for machinery is a great improvement on the 1851 Exhibition, where everything was under the same roof; for, admirably arranged and ventilated as that building was, yet the smell of oil and grease inseparable from machinery occasionally intruded itself on those who were examining objects which might have been expected to afford an exemption from that unpleasantness.

The western annexe is 975 feet long; for a length of 720 feet it is 200 feet wide, the remaining 255 feet being 150 feet wide. The east side is enclosed by the back wall of the west arcade of the gardens; and the west side, which adjoins the road, has a plain lath and plaster front. It is covered by a ridge and valley roof, supported on most ingeniously-constructed light wooden ribs of 50 feet span, placed at intervals of 15 feet. These ribs are similar in construction to those of the nave—that is, they are formed of planks nailed together—but they are very much lighter. The circular portion springs at a height of 10 feet from the ground line. Its elevation is nearly half of a regular polygon, described about a semicircle whose diameter is

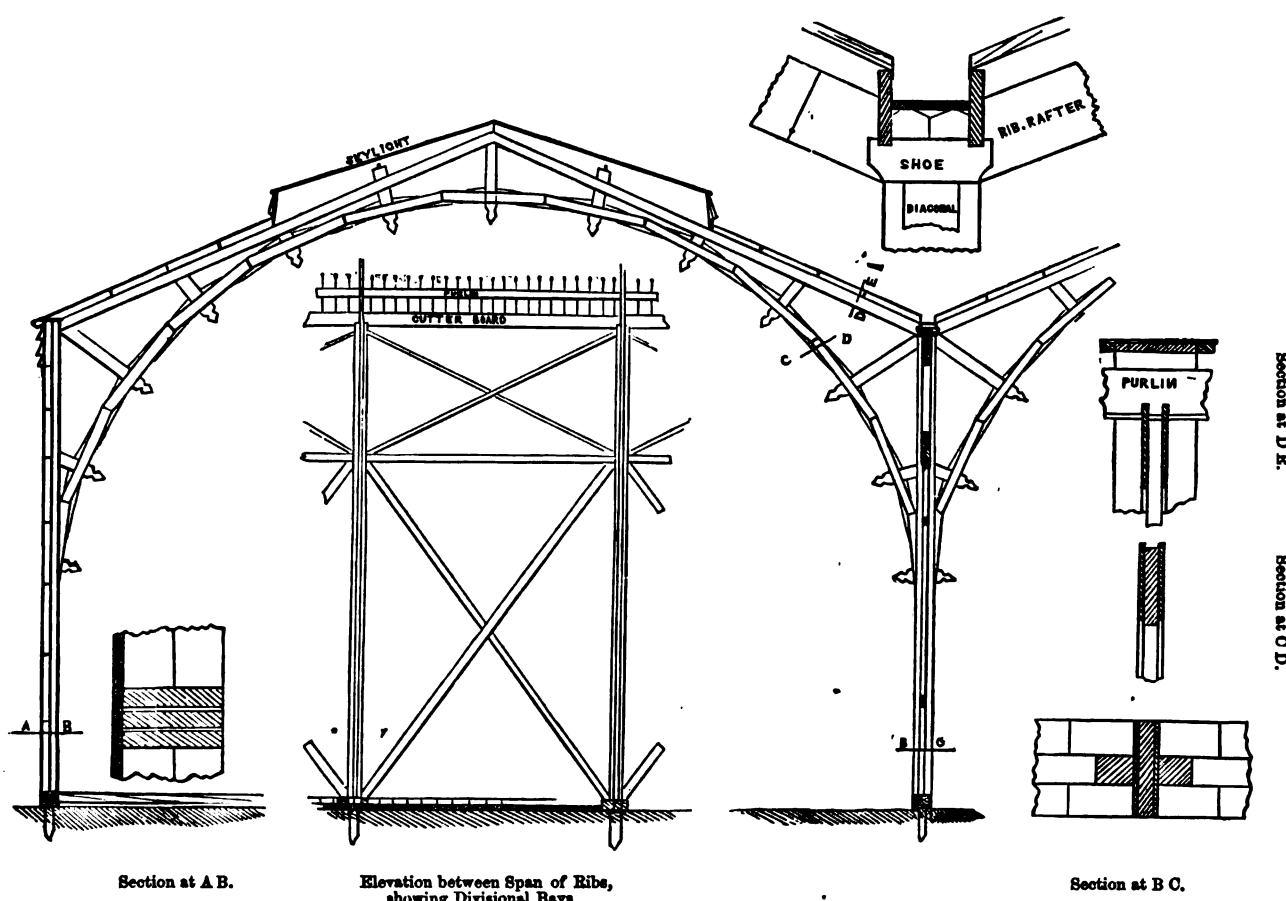


Inside Elevation of Walls between Ribs.

50 feet; it consists of three planks 9 inches wide; the centre plank is $1\frac{1}{4}$ inch thick, and has nailed to it on either side a $\frac{3}{4}$ -inch plank, the ends arranged so as to break joint regularly all through. The principal rafters, which are composed of two $\frac{3}{4}$ -inch planks, rise from

TRANSVERSE SECTION OF ARCH OF ANNEXE.

Detail of Valley Gutter.



a height of 28 feet above the ground, and meet above the curved ribs, so as to make the ridge 5 feet above the crown of the arch. The upright, which has its foot morticed into a sleeper resting on piles, is formed of $1\frac{1}{2}$ -inch centre plank, with a $\frac{3}{4}$ -inch plank on each side, having a strengthening piece $4'' \times 3''$ spiked to it on either side, to prevent its bending. The principal rafter and upright are connected with the rib by radial pieces of $1\frac{1}{2}''$ plank, which are brought rather below the intrados of the curve, and finished off for the sake of ornament by a spear head. The roof frames are therefore merely planks nailed together, and so disposed that their weight comes on their edge. One half of the roof is covered with boards and felt, and the other half has a glazed skylight with louvres for ventilation throughout the whole length. The span of each rib being 50 feet, in the 200 feet width there are four spans, and in the 150 feet three.

The west annexe is devoted to the exhibition of machinery in motion, for which purpose steam pipes, water pipes, and shafting are led through it. There is a boarded floor all through, but the heavy machinery is of course bedded on the ground, independent of the floor, which is only used for passages. The entrance to it is through the north end of the west transept, from whence the successive ribs of the roof afford a beautiful perspective view from end to end, and produce a singularly light and elegant effect.

The superficial extent of the west annexe is 184,000 square feet, or about $4\frac{1}{2}$ acres; it is of itself a perfect exhibition of its kind, and contains the most ingenious mechanical contrivances of this inventive age. To a mechanical mind this will doubtless be the most interesting section of the Exhibition, for here will be grouped alongside each other, performing their several offices, the most cunningly devised machines in the world. What endless occupation and suggestive thought will a careful comparison of them give rise to!

The building itself is worthy of its contents, for in ingenuity, economy, and simplicity, it is allowed to be a triumph of construction. It requires no framing; any person of ordinary intelligence, able to drive a nail, could construct the ribs, which have nothing in them but nails and sawn planks. Each rib was made in a horizontal position, over a full-sized drawing, marked on a platform, and when complete hoisted vertically by means of a derrick. To prevent it from bending, which from its extreme thinness it was very liable to do, it was stiffened while being raised by having scaffold-poles tied across the angles,

which themselves formed the scaffolding for finishing the roof. The frames are braced together at the top of the uprights, and the ribs are strutted from the wall plate to prevent buckling.

The rain-water is let off by pipes, attached to every third rib, to drains under the floor. Full details of this shed are given in the sketch, which will, we trust, completely show its construction. These roof-frames were first of all used in the roof of a drill-shed designed by Captain Fowke two years ago for the 1st Middlesex Engineer Volunteers, at South Kensington. The span of this is 40 feet, and the boards are even lighter than in the annexe roof. The roof of the entrance to the Horticultural Society's Board-room was the next made, and its ribs are of exactly the same dimensions as in the machinery shed, except that in the latter they are stilted up six feet higher, and are 15 feet apart instead of 10 feet.

It has since been copied in several Volunteer and other sheds, and it is doubtless capable of very general application, whether used in temporary or permanent buildings, for it can be made of any required strength by merely increasing the planks. Its great advantage is the absence of any bolting and framing.

The eastern annexe is exactly similar to the western in its construction; but by having a large open court, 350 feet by 100 feet, left in it, its covered area is only 96,000 feet. Its total length is 775 feet, and it is entered from the east transept by means of a covered communication or tunnel under the porch of the Horticultural Gardens.

This annexe is intended for large agricultural implements and any other heavy machines which do not require to be put in motion to show them off.

Large metallurgic, mineralogical, and geological specimens, are also placed here, and 30,000 square feet at the north end has been most judiciously set apart for a third-class refreshment room.

LAYING OUT OF THE WORKS.

The laying out of the works was commenced on the 9th March, by three independent agencies—Mr. Marshall on the part of the contractors, while Mr. Wakeford and Sergeant Harkin, Royal Engineers, acted for the Commissioners.

The greatest care had to be taken with the measurements, for the slightest error would have thrown out the work considerably, and have occasioned great difficulty in fitting the girders. In the three

separate measurements made, the mean variation was only three-eighths of an inch—a difference quite imperceptible in a piece of ground 1200 feet by 600. A glance through any of the aisles will show how accurately the work has been conducted, and whether they are examined diagonally or on the square, the columns will be found to range in line as perfectly as they would show on a plan. About two weeks were occupied in making the measurements, so that the building may be said to have been actually commenced in the beginning of April, since when its progress has been uninterrupted and rapid.

Too much praise cannot be given to the enterprising firms which have executed this stupendous building. Commencing at a time when the labour market was in a most unsettled state—when trades unions did their utmost to induce strikes and discontent—they have had no ordinary difficulties to contend with; still they have held bravely on their course, and have now the satisfaction of seeing the work completed in time to enable England to keep her word with the world, and celebrate the eleventh anniversary of the opening of the first of International Exhibitions by inaugurating a second, which will, we hope, be as successful as its predecessor.

Before his mind is absorbed by the varied contents of the Exhibition, let the visitor pause and contemplate the vastness of the structure itself, and we venture to assert that when he remembers only twelve months have been occupied in its construction, it will be as striking an example of the pre-eminence of English skill, energy, and resource, as any of the numerous objects which will subsequently claim his attention.

Let us hope that the contractors will reap all the advantages they deserve from their spirited undertaking, and that it will prove a remunerative one to them in every way.

It may, perhaps, interest some of our readers, and at the same time give an idea of the size of the building, to state the quantities of the materials used in its construction. There are upwards of 10,000,000 bricks, which were all supplied by Messrs. Smeed, of Sittingbourne. Nearly all the cast-iron work was supplied by the Staveley Iron Works in Derbyshire, and there are upwards of 4000 tons of this metal in the building. As a proof of the excellence of the castings, it is only necessary to state that out of the total quantity of girders proved, only four were found unable to undergo the test of the hydraulic press.

There are 850 25-foot columns, equal in length to upwards of four miles; and if the 1266 girders used were placed end to end they would reach a distance of six miles. The wrought iron has been supplied by the Thames Iron Company, the builders of the *Warrior*. This firm has furnished all the iron for the domes, the groined ribs, the 50-foot roofs, and the iron trellis girders which support them. The total quantity of wrought iron in connexion with these parts amounts to 1200 tons.

The woodwork was executed partly at the works of Messrs. Lucas, at Lowestoff, and partly at Mr. Kelk's yard, at Pimlico; the former prepared all the window sashes, &c., by machinery, and the latter constructed the ribs of the nave and transepts. Upwards of 1,300,000 superficial feet of floor had to be laid. There are 553,000 square feet of glass used, equal to 12½ acres, and weighing 247 tons.

The greatest care has been taken to have ample means at hand for the prompt extinction of that enemy which is common to all buildings, and of whose ravages we have recently had such fearful examples—fire. Water, under pressure, has been laid on to every part of the building, and is distributed by hydrants carefully placed on the ground floor, the galleries, and the roof-flats. The water is supplied by the West Middlesex Water Company, and will have a head varying from 200 to 100 feet. A nine-inch main traverses the building from west to east, and from it 4-inch branch pipes are led in all directions to supply the hydrants. As in 1851, there will always be a trained body of men on the spot to attend to all arrangements for working the hydrants, hoses, and engines; so that if unfortunately a fire should occur, a few minutes will suffice to bring a powerful column of water against any point.

In concluding this account of the building, we wish our readers to bear in mind that, though we are impressed with the conviction of its providing for the wants of the Exhibition better than any building has hitherto, yet it must be allowed that very much remains to be done to render it a complete and permanent edifice. We believe that no building covering 24 acres, as this does, has ever been erected at so low a cost as 430,000*l.* It is only at the rate of twopence per cubic foot; the average rate for first-class dwelling-houses is 1*s.* 4*d.* The Houses of Parliament cost 3*s.* per cubic foot, and ordinary public buildings may be taken at 1*s.* to 9*d.* per foot. It is hardly necessary

to point out how unreasonable are the animadversions on this building, where economy has reigned paramount, in expecting that 1*l.* should do as much as 6*l.* or 8*l.* in other cases. The building can only be viewed as an utilitarian structure for the present. When the Exhibition has succeeded, and the guarantors are free to deal with a surplus—when another decennial Exhibition shall have further augmented the available funds for its decoration—then we venture to hope that the means and desire will not be found wanting to complete the work now begun, and render it worthy of being the home of International Exhibitions for future generations.

DECORATIONS OF THE INTERNATIONAL EXHIBITION.

MR. J. G. CRACE, to whom the task of decorating the Exhibition building was entrusted by the Royal Commissioners, read a paper on the subject before the Society of Arts, on the 9th of last month, from which we select the following as illustrative of our plate of details. Mr. Crace says:—

"I confess that when I first saw this interior my heart quailed; its general aspect was not encouraging; the day was damp and bleakly cold; the rough polygonal arched principals and diagonal boarded ceiling looked heavy and difficult to manage; the light from the clerestory windows fell in faint streams on the muddy road, that was then the traffic way in the interior; masses of dark scaffolding, obstructing the light from where the domes were then being erected, and the various trials of colouring which had been already made, one at least of them by an able man, showed me that it would require very careful consideration indeed before I should decide upon what style of decoration to adopt. Do not let me be unjust, nor let my own apprehensions as to a successful treatment of the decorations lead you to suppose that I mean to reflect on the building itself. When I came quietly to consider all the features of the construction, I found that those apparently heavy principals only required to be properly treated in colour to be sufficiently light; that they were also of most ingenious construction; that the proportion was pleasing; and that the light of the clerestory windows was amply sufficient. I fear that many may have seen the building under the same adverse circumstances that first presented it to my view, and have passed criticisms not so just as the merits of the undoubtedly talented contriver of the building should deserve.

"Well, we are in the nave. How to decorate it? I had not too much time to think, the work must be done; it was January the 23rd when I received the authority from the Royal Commissioners to assume the decoration of the building with the entire responsibility of the results, and the work was to be completed by March.

"After careful consideration I decided that the general tone of the roof must be light, and that the best colour would be a warm pale grey; that the arched principals must be made to stand out clear from the roof; that they must look well in a perspective of 800 feet; and that they must not look heavy or confused as they approached each other in the distance. No single colour would do, and after a pretty stiff bit of reflection of twenty-four hours, I confirmed myself in my opinion of what would be the most likely way of treating the principals.

"I have remarked that the form of these is polygonal. They are in three thicknesses, the centres of the outer planks covering the joints of the inner ones.

"I considered that the form precluded the use of a continuous repeat ornament; I therefore decided on following the form of the construction, and adopted panellings of blue and red alternately, relieved by coloured lines, intersected at the joints by circles of black, on which are gold stars, and from these spring ornaments in vellum colour with green in the filling, as shown in the coloured drawing.

"Following out this arrangement I had a pattern painted on paper of the full size of one of the principals, and it was fixed in its place within a week from the time of my appointment; part of that identical pattern is now in this room; it has never been altered, and thus exactly it has been carried out throughout the roofs of the nave and transepts.

"Until the principals were coloured, it seemed to me that the thicknesses were lost; I wished to make the construction evident, and I therefore coloured the two outer edges in chequers of black and vellum colour, and the centre edge full red. As to the bracings above the polygonal arches, I coloured them the warm wood-colour, with red or blue coloured lines on the face, and the under thicknesses red.



ROBERT DUDLEY, DEL ET LITH

VINCENT BROOKS, IMP.

INTERNATIONAL EXHIBITION, 1862.

DETAILS OF INTERIOR DECORATIONS

- | | |
|--|---|
| A. ROOF, MAIN RIBS & COLUMNS OF NAVE & TRANSEPTS. | D. SPRING OF THE LAST ARCHES OF NAVE TOWARDS THE DOMES. |
| B. COLUMN & HAND AT LEVEL OF GALLERIES. | E. SUPPORTS OF FLOOR OF THE PICTURE GALLERIES. |
| C. CAPITALS OF COLUMNS SUPPORTING MAIN RIBS OF ROOF. | F. DECORATION UNDER DOME LANTERN. |

"I have said that I decided on warm grey for the roof of nave. I did so because it gave space and lightness; and on its surface I introduced an upright scroll ornament in red, with gold, star-like rosettes, sparingly introduced. My object in this ornament was to raise the apparent pitch of the roof, and to relieve and warm the effect of the grey. The horizontal purlines, on the contrary, I kept purposely light, so as not to depress the rise of the roof, or interfere with or confuse the effect of the principals. The ridge piece of the roof, in itself comparatively small, I marked as strongly as possible, as the apex, in black and vellum white, *en chevronné*; on each side I coloured a margin of maroon red, and a little below that a bordering of very warm green, shaped to accord with the top scrolls of the red vertical ornament, the green being relieved with rosettes of gold colour. At the base of the slope of roof this green is again introduced in much the same way, and the band of maroon also. Below this are the clerestory windows.

"The next important features in the nave are the iron columns, supporting the principals as well as the galleries. These I have painted pale bronze colour, relieved with gold colour vertical lines. The capitals are gilt; the grounds of the ornaments being picked in rich red or blue alternately; the centre blocks of the columns are also coloured red, with bands of blue, or, *vice versa*, the mouldings being gilt, and the same style of colour is continued to the bases. The top plate above the columns is painted bronze colour, relieved with light gold colour ornament on the upper part, and a vitruvian scroll in gold colour, with a maroon red base on the lower part.

"The gallery railings are light bronze colour, the rose, shamrock, and thistle ornaments being partly gilt, and the whole backed with deep red cloth. The plate under the gallery is painted oak colour, relieved with deep brown interlaced ornaments.

"I have kept the part below the line of arches purposely quiet in colour, in order that the brilliancy and richness of the various articles exhibited may not be interfered with. The roof, on the contrary, is rather vivid in colour, to carry up, as it were, in some degree, the gaiety of the scene below; and this will be still further sustained by a series of banners of the various countries whose products are assembled in this International Exhibition.

"Much variety of opinion has been expressed at my introduction of the vivid colours in the arched principals of the nave; but I think that many who fancied it would look too powerful, will confess their surprise at its comparatively quiet effect now that it is completed. The colours being properly balanced, have neutralized each other. Most of you probably know that blue, red, and yellow, in the proportion of three, two, and one, when mixed with white, produce a grey, exactly the same as the grey produced by mixing black and white. I will show you. I take ultramarine blue three parts, vermilion two parts, and chrome yellow one part. I mix them together—add some white—you observe it is grey. I take some black and white, mix them, and identically the same grey is produced. If you paint on a disc radiated stripes of blue, red, and yellow, in proper proportions, and make the disc revolve rapidly, you find grey produced, the same as if they were stripes of black and white. The effect of the roof of the nave exemplifies this theory.

"I have heard it said by some that it would have been better to have employed panellings of one colour instead of two to each principal, and made the principals alternately blue and red; in my opinion they would have been utterly disappointed; the striped contrasts would have by no means given the softness, richness, and glow of the present colouring. To convince myself, I, at one stage of the colouring, tried, by fixing blue paper over the red panellings in one principal, and red paper over the blue panellings of another, but the effect was not nearly as good, and I was confirmed that the principle I had adopted was the right one.

"You will find this principle of counterchanging colours adopted in most of the decorations of the early masters, which abound in Italy. Those decorations, so beautiful, so interesting, rich, glowing in colour, full of fancy and taste in the ornament, the masses well arranged, show the most perfect harmony everywhere, and are dignified by often acting as the framework of the highest gems of art. But I must not be led astray from my more immediate subject. Having described the nave, I will now proceed to the domes which rise at either end of it, and form a point of intersection with that and the transepts. They are undoubtedly the main features of the building.

"In plan their form is dodecagonal, or twelve sided, but they are made to assume the appearance of an octagon, because the arches

towards the nave and transept cross each other, and form a kind of angular-arched opening of 85 feet span, the intermediate arches being about 35 feet span. From the floor of the nave to the springing of the domes is 114 feet, the total interior height to the crown of the domes being about 200 feet. There are 12 main ribs to each dome, meeting in a sort of ring plate, and thence eight of them carry on to the centre. The crown of each dome has an ornamental zinc covering, as explained in the drawing; all below this is glass.

"My principal difficulty in carrying out the decoration of the domes was, that I could see nothing of them. The scaffold formed a series of solid stages or floors, through which it was impossible to view anything; and I confess I never could mount the ladders above 100 feet; but even there the scaffolding was so thick that I could see nothing of the top, and very little of the cornice, fascia, and walls.

"At last Mr. Ashton, the engineer, contrived to get for me an open square box into which I got, and I was drawn up by means of his beautiful little engine very pleasantly to the top; yet when I got there the ceiling almost touched my head, so that I had no opportunity of judging beforehand of the effect of distance and light upon my colouring, and I knew well that they were very formidable elements for consideration. The knowledge that the scaffold would be taken down before I could possibly judge of the effect, and that when once down I could never hope to touch my decoration again, caused me many an anxious thought.

"The plate will best explain the colouring adopted for the top of the domes. The main ribs are painted bright red, with spaced black and white at the edges, and a fine gold line up the centre spreads at intervals of about four feet into lozenges and circles containing gilt stars on a blue ground; where the main ribs reach the ring plate I carry round the red, marking the points of intersection with black and white; thence the eight main ribs are painted deep blue, relieved with red, gold, and black, until they meet in the centre pipe or pendant, which is gilt bordered with red. The shaped covering, or umbrella, as I am accustomed to call it, is painted light blue; gold colour and gilt rays diverging from the centre and streaming a considerable way down the blue, the shaped outline of which is bordered with red and gold ornament.

"In decorating the walls of the domes, the solid parts between the arches, and the springing of the roof, it was necessary to consider the probable effect of the great mass of light above. On the one hand it was desirable to sustain it with sufficient strength of colour, on the other it would be dangerous to make it too heavy.

"The moulding of the cornice and fascia are painted vellum colour, very slightly relieved by gilding; the trusses are gold colour; the fascia between them is red, with a vellum patera; the soffit is green. The broad fascia below is painted blue, and on it is inscribed in gold letters, three feet high, the exordium of David, in the 29th chapter of the first book of Chronicles, 'Thine, O Lord, is the greatness, and the glory, and the victory, and the majesty: for all that is in the heaven and the earth is thine; and 'O Lord, both riches and honour come of thee, and thou reignest over all; and in thine hand is power and might, and in thine hand it is to make great.'

"The large iron columns, which rise nearly 100 feet high, are painted dark maroon colour, their capitals being richly gilt. The panelling between the arches and the frieze is painted in shades of red, relieved by coloured lines; in the four broad compartments are inscribed, on dark green panels, Europe, Asia, Africa, and America; below, on a circle, are the initials of those so beloved by us all—Victoria and Albert. On the eight spandrels to the four main arches are medallions, eight feet diameter, by Mr. Burchett, of the Kensington School of Art, emblematic of Manufactures, Commerce, and the various arts and sciences which lend their aid. These were executed in an exceedingly short time, and, like all the rest of the work, with no opportunity of judging how they would look in their elevated situation. I should add that round the red panelling is a broad margin of sage-green, on which are stencilled pateras. The moulding of the arches is painted vellum-colour, the top fillet being gilt; and the face of them ornamented with vitruvian scroll in dark colour.

"The walls at the gable end of the nave and transept are treated so as to recal the arched form of the principals. Under these a semi-circular panel is formed of warm brown colour, bordered by a broad blue margin, on which are gold stars. Inside the panels are written the following sentences:—

"On the east end of nave—

The wise and their works are in the hand of God.—Ecclesiastes, chap. ix. ver. 1.

"On the east end of transept—

Alternately the Nations learn and teach.—COWPER.

"On the south-east end of transept—

Each climate needs what other climes produce.—COWPER.

"On the west end of the building the sentences are in Latin, being the part occupied by foreign exhibitors. At the end of nave is written—

Gloria in excelsis Deo et in terra pax.

"At the north-west end of transept—

Domini est terra et plenitudo ejus.

"At the south-west end of transept—

Deus in terram respexit et implevit illam bonis suis.

"Inside these semicircular panels are a series of radiating panels, painted maroon, and bearing the names of the various sciences and arts which have affinity with the objects exhibited. The coloured drawing will more directly explain what I have thus endeavoured to describe.

"I have mentioned that on either side of the nave extend the series of courts roofed with glass. These admit of very limited decoration, and the colouring I considered should be of a subdued and retiring character. The objects exhibited are to be the show.

"The brick walls which form the boundary on one side not being dry, it was necessary to have a colour which would not be materially affected by that circumstance. I adopted a quiet maroon colour, made with venetian red and purple brown. The columns are painted pale bronze, relieved by gold colour. The skylight frames are painted cream white, relieved by lines of red and blue alternately. Under the galleries the ceilings are painted very light grey, the joists cream-white, the bottom edges lined blue, and the girders lined maroon red.

"Nothing is so charming and so refreshing to the eye as an harmonious arrangement of colours; they are 'like a sweet chord of music to the sense.' The hand of nature never errs, whether it brings together scarlet and crimson, as in the cactus; scarlet and purple, as in the fuchsia; yellow and orange, as in the calceolaria; or the colours in the varied plumage of exotic birds—the harmony is always beautiful, ever perfect. The laws of harmonious colouring are a necessary part of the knowledge of the manufacturers of coloured fabrics.

"I will suggest a few contrasts.

1. Black and warm brown.
2. Violet and pale green.
3. Violet and light rose colour.
4. Deep blue and golden brown.
5. Chocolate and bright blue.
6. Deep red and grey.
7. Maroon and warm green.
8. Deep blue and pink.
9. Chocolate and pea green.
10. Maroon and deep blue.
11. Claret and buff.
12. Black and warm green.

"Resuming our immediate subject, we will now return to the principal staircase, which we passed on our entrance from the Cromwell-road. The walls of the lower part of this staircase will be painted maroon red, as a background for the statues, bas-reliefs, and other art works which will be placed here. The upper part of the wall, or, rather, space above the wall, will be enclosed by the various specimens of stained glass. Arrived at the landing, we enter the centre vestibule, from which we first gain the view of the magnificent range of picture galleries, extending 500 feet on each side. This vestibule will itself be filled with sculpture. The walls are coloured subdued red up to the string course, above that they are sage green.

"The picture galleries on the east side contain the collection of the British, those on the west side the foreign schools; in size and arrangement they are exactly the same. The width of the galleries is 50 feet; the wall is 31 feet high, up to the cornice, from which springs a deep cove supporting the centre light.

"Many of the pictures to be exhibited having been painted many years, it was essential to have a very low tone of colour for the walls; I adopted a sage green. When the colouring was partly done, and there remained some of the white wall still uncoloured, it was thought by many that the tone would be far too dark, and I mention this to show how difficult it is to judge of effects of colour till all the parts

are complete. I never at present hear any fears expressed of the too great depth of colour. The cornice is painted vellum colour with maroon in the hollow, the ground of the cove is tinted of the same hue as the walls, but much lighter. I have divided it into two compartments by upright margins in vellum colour, on which is stencilled ornament on a deep ground; the compartments of green have marginal lines of maroon. The soffit is also vellum colour relieved by stencil ornament in maroon, and the upper cornice is cream colour.

"The end walls of the principal galleries are slightly decorated; on either side of the arched entrance it is intended to place statues, and therefore it was necessary to have a maroon-red panel background; this is carried up to the springing of the arch, and thence broken into five concentric panels; above these are painted ornaments supporting medallions, in which are inscribed the names of painters.

"To show with what energy it was necessary to carry out the works, I will mention that the whole of the picture galleries on the east side were painted and decorated in five days. I was asked on Saturday if my designs were ready—I decided the colours on Monday morning, the work was commenced at mid-day, and completed mid-day the following Saturday.

"Having thus described to you, very imperfectly I confess, the decoration we have done, let me explain to you, briefly, how we did it. It was indispensable, in all the designs for the decorations, that they should be so arranged as to be easy of execution; that the important principle of 'the greatest effect at the least cost,' should be strictly attended to. Therefore, all ornament had to be done by stencilling, and all the colouring on woodwork was to be done in distemper. What the stencilling is I will explain presently. Distemper is a very ready means of colouring surfaces, because one coat of it bears out and gives a result more solid and more luminous than four coats of oil paint, but it has the disadvantage of not being preservative like the last, and it cannot be washed. Perhaps no one will ever discover the very rough state of the principals of the roof of nave, which are simply saw-cut, besides being blemished by the process of carting and lifting them. The coat of distemper conceals all that. It is composed of whiting and size, made of any tint required by adding the usual colours.

"Stencilling is performed by cutting out the pattern required in stout strong paper, which is then varnished over to strengthen and preserve it; taking care also to leave proper ties to keep the pattern together. I think that in the progress of the work more than 100 men must have been employed at this stencilling, out of whom, I have reason to believe, scarcely half-a-dozen ever did it before, and yet the work has been very well executed, and reflects much credit upon all those engaged upon it."

LONDON STREETS.

UNLIKE the moralist and the philosopher, we traverse the Streets of London unmindful of the restless ever-changing throng that perpetually swarms and surges around us. Our thoughts are intent upon the long lines, not of busy men and toiling horses, but of the buildings that stretch away to the right hand and to the left, apparently in interminable succession. And yet we claim a fellowship with living sympathies—for every one of those myriads of dingy bricks has been set in its place by human hands; and the care and observation of men like ourselves, and perhaps also their thoughts and feelings, have been freely expended upon the production of all this vast maze of houses. But our present concern is rather with their works than with the builders of these London Streets. We are observing the Street Architecture of the metropolitan city, and our remembrance of the civic architects and builders is only incidental to our inquiry.

The Streets of London have always conformed to the distinctive character of each successive period of English history; and from age to age they have retained a few lingering relics of bygone times. At the present day the tale of Roman occupation is to be read by searching deep down amongst the foundations of the existing London. The Norman and the Gothic architects have left for us occasional specimens of their works above the surface. Their successors have followed their example; and Wren and Inigo Jones have transmitted the architectural genealogy, through the stucco period of the Regency, to our own era. And now Victorian London is engaged in earnest upon the work of transformation into a new city, conformable with the spirit of the age.

It will be our duty, month after month, to record and delineate the progress made towards a new and better state of things, always availing

ourselves of the observations of those who, with keen artistic eyes and a just appreciation of the useful and ornamental, are engaged in similar studies with ourselves. On the present occasion we gladly avail ourselves of the company of Mr. James Edmeston.*

"The antiquary may experience a pang at the disappearance of the old landmarks of history, and of spots hallowed by the footsteps of those great in literature or art; but for the most part the lover of the fine arts can afford to view these inroads at least without regret; occasionally, indeed, he may find cause to grieve, but this is rather when some object of beauty becomes lost or obliterated. For example, I observed very recently that the old hall in Bishopsgate, built for Sir John Crosby in 1471, interesting to the antiquarian as having been the council chamber where Richard of Gloucester held his secret council, and whence he ordered Hastings to the block, and worthy of notice from the lover of art on account of its architecture, has at last descended to fulfil the very ordinary purposes of a wine merchant's cellar—a fate which the handsome old hall hardly deserved, and which we must all regret. That the old houses of the early part of the last century, with their originally careful, but now more or less dilapidated, brickwork, their window-frames flush with the face of the wall and fitted with heavy sashes, wooden cornices and doorways (well designed though those latter often were), should make way for modern structures, no one need regret. The roofs of these buildings were often picturesque in their outlines, but on the whole they had very little art about them externally, and they did but prepare the way for the Harley and Baker streets of more recent era, whose day, I trust, is gone for ever.

"London, perhaps, has fewer remains of its former self than might have been expected from its age and long and ever-growing prosperity—though, in truth, it is this very prosperity which has had much to do with the demolition of old buildings. Old London, unlike some of the better preserved Continental cities, was built mostly of wood, plastered over—liable, therefore, to decay, and quite unfit for many purposes to which buildings of stronger construction might have been applied when altered circumstances came, and which thus might have been preserved. Buildings of stone walls and oak floors would have made very good warehouses: not so the old half-timbered houses, with their gabled fronts overhanging story beyond story.

"London in many parts may certainly be called picturesque, full of sites offering fine opportunities for effect. One part has grown out of another, as occasion made necessary. No generally dominant idea can be said to prevail; it has spread, and that to a most inconvenient extent—unfortunately, not upwards, by which it might have become a far finer city; but a great growth of area has taken place, adding nothing at all to the general effect. The sites I allude to are not such as Oxford-street or the Strand—broad, straight streets, which might be flanked on either side by lofty buildings, with a predominance of long, level cornices and lines in their composition, like the new Parisian boulevards—but Holborn-hill, Ludgate-hill, Fleet-street, Cheapside, Whitehall, Piccadilly, &c.—localities which, all of them, invite that particular treatment which we find exemplified in the new buildings in Bishopsgate-street, opposite Crosby Hall, a coachbuilder's premises near the Park, in Piccadilly, and those very striking schools in Bloomsbury, with others I might name. In the situations above named, how can the eye be satisfied unless there is a broken and well-defined sky-line, a certain amount of irregularity, order within disorder, in that which we call picturesque, an acceptance of every little difficulty in order to clothe it with beauty and meaning?

"There is something so oppressive to the imagination if one pictures sites like these as being rebuilt in the studied, carefully cut-up, divided, and subdivided styles of Italian architecture, as practised in this day, that one would almost rather they remained as now, with little or nothing to boast of architecturally, as a whole; and let it be specially borne in mind that you, who are not building houses yourselves in these localities, may yet be able to influence others who do so. Every building will become an item in the final result, and I know how often everything is overlooked except mere utility—nay, more, that the architect is often blamed if he is supposed to give much attention to external appearance.

"Writers in the public papers commonly speak of the architect as being the ruling power in all cases. Indeed, he is no such thing, and in the majority of instances he is obliged to give up many points which he would far rather have maintained; and in many more cases he knows beforehand that to attempt what his client would call wild

vagaries, or pretentious display, or needless outlay, would lose him his business, and soon compel him to retire, without even what the advertisements call 'a moderate competency.' Where there is an intentional and studied effect visibly apparent, and the result of which is bad, of course the architect should be blamed; but this is not the reason of failure in the great majority of instances which excite adverse criticism. If I see a design, in one part of which the architect has set his thought, which he has filled with the impress of his own mind, where he has ventured to indulge in some piece of good and effective design, and has dared to introduce some judicious and well-studied ornament—almost by stealth, as it were—I know I must absolve him from blame if the rest of the design be bald and uninteresting, flat and commonplace, or even in some aspect of proportion or arrangement offensive.

"In street architecture the surface decoration has, for the most part, a secondary office to fulfil: the buildings are seen in a sharp perspective, and the projections, reveals, and soffits contribute most to the effect, particularly bay windows or corbelled turrets, and an effective treatment of the roof, which latter, I think, should not have too much projection, but should cut well against the sky, and should obscure as little as possible of the upward view; in street architecture especially do the roofs play a most important part, both by the picturesque outline they may present, and by the more varied effects of light and shade which they contribute where the light may fall. I cannot well imagine any street ugly where there is a general harmony of main lines, and a well-studied and picturesque treatment of the sky-line; while I cannot imagine a plain row of houses looking very well, where there may be an elaborate care bestowed in the treatment of the flat surface, but which ends only with a plain level parapet, presenting one never-varying effect against the sky, and throwing one dead shadow on the opposite side.

"In truth, the elements of good effect, if not of beauty, in street architecture are much simpler than most people imagine. If the main outlines and general proportions are good, if the architect's practised hand and trained eye have thrown the parts together with a regard to fitness and simplicity, the absence of ornament and costly decoration will hardly be felt at all—not that the capability to impart this satisfying and happy result is the easy and early attainment of the architect; on the contrary, it is, perhaps, one of the last things he learns, for it is an easier matter to design an ornamental feature, good in itself, than to know well beforehand, on the paper, how to give the best effect to the masses of buildings in execution, where so many extraneous causes may conspire to make or mar the success of the composition. Grouping of the masses and telling outline against the sky are certainly the main things to be observed. The building erected opposite Crosby Hall, and before alluded to, is very ornamental in its details, but if nearly all that ornament were dispensed with it would still look almost as well; this may also be said of the new 'Life' offices in Bridge-street, Blackfriars, and of some of the new hotels which have recently been erected: but for admirable outline, balance of parts, and grand general effect, what can exceed St. Paul's, as seen from Ludgate-hill? Is it the sculptured pediments or other architectural enrichments which attract the eye, and fix the building on the mind of the beholder? or is it the towering magnificence of the lofty dome, and the play of light and shade, the solidity and repose, the breadth at once and the lightness of effect of the whole composition? I know of nothing to surpass the view obtained of the Cathedral from the point above named. As the roof in Gothic architecture, so the dome and cupola is the great element of picturesque treatment in Classic architecture; and it is partly, perhaps, because roofs are more common and more useful than domes, and that lowness of pitch will harmonize with Classic architecture and not with Gothic, that the latter has gained so much in public favour. That the want of a fitting accessory of this kind is felt and acknowledged is sufficiently proved by the fashion lately set in, of making high and steep sloped roofs with or without a flat top, and in this way Classic architecture redeems itself almost entirely from reproach in this respect. I may instance the Tuileries as a striking proof of this; and among ourselves we have many instances—the most recent, perhaps, is the Duke of Buccleuch's house, at Whitehall-gardens, though whether the feature here is treated altogether judiciously may be a question for the critics.

"Our street architecture is, upon the whole, lamentably deficient; and when one really feels how wonderful the change would be if any of our fine main thoroughfares could be remodelled with careful study as to the roofs alone, it is impossible to help dwelling on the point,

* See Paper read before the Society for the Encouragement of the Fine Arts, April 10th, by Mr. James Edmeston.

and very earnestly entreating all who can do so, to consider and to advocate the subject as opportunity arises, the difficulties interposed by the Metropolitan Building Act notwithstanding.

"There is, however, another point in connexion with our street architecture not easily to be dealt with, but which it would be most desirable to control if it could be done, which is, that it constantly happens that new buildings very much spoil one another, and very needlessly; every man considering just exactly what he has before him, and utterly ignoring what will exist on each side of his design when executed. The result is most painful; moulding and cornice are abruptly cut off, every feature is utterly at discord in each case with the others; no pains even is taken to render the design complete in itself, and the front looks as if it had been intended to be one of a row, which, by some change of intention, was never continued. To enumerate instances would be needless; every main thoroughfare exhibits them, and strangers must be struck with this state of things as a peculiarity of municipal management of a most extraordinary character.

"I fear no ordinary means are sufficient to cure this state of things. In the present state of architectural feeling, while the battle of the styles is either breaking out in open fury, or smouldering out of sight and ready to break out, there is an habitual disregard of other than personal feeling, and rather a delight in showing contempt for all work of a different character brought into juxtaposition. It becomes, for example, an article of faith to show as much as possible how the creed professed by the disciple of Gothic architecture differs from that of the Classic architect, who has been at work on the next plot of ground, and *vice versa*, though perhaps the injury sustained is at least equal to that inflicted. All this is wrong, and is perhaps at the present moment the greatest bane of our street architecture, every integral part destroying its neighbours as far as it can, whereas the study should be to make the whole as perfect, as a whole, as possible. Now, far be it from me to recommend that public censors should be established in matters of art, or that there should be any additional legislation in such matters; still I do think that some general rules might be laid down applicable to our main thoroughfares, and which would injure no one, interfere with no private rights, and which would succeed in reforming to some extent the present state of chaos. For example, just as a certain line of front is established, let certain main lines of elevation be fixed, which shall not be departed from; let the height of the ground-floor stories be fixed, the line of the top of the one-pair windows, the line, say, of the coping or finishing gutter, leaving all above that free. Now, this would only so far control designs as to enable the architect to show his talent, which would enable him to keep these main lines as boundaries, while he would fill up between them as suited the requirements of the work in hand. He might in the interval have fewer or more stories than his neighbour, he might divide them differently, and an absence of all sameness would be secured; but there would be just so much control over the *ensemble* as would tend to promote a general harmony of effect. And if, instead of every man cutting off his projections ruthlessly just where the centre of his party-wall may come, he was compelled, in a give-and-take way, to return and finish them properly, while the lines of one composition were made either to lead out of those already established or else to be made properly distinct, I can believe that a great gain in our architecture would be accomplished, while there would be as much freedom as there is now. A government or a municipal body has something to answer for in this respect. What shall be said if the re-arrangement of the new Government offices at Whitehall is not complete as a whole, every part helping every other part? How admirably is this carried out in the capital to which we have before referred. I think it is a disgrace to our 'local management' that the beauty of our city is not cared for in its several districts as well as the cleanliness, and I believe it might practically be done.

"Many new streets and approaches are now being laid out, some of the most important relating to the Thames embankment, and now is the time for making some effort in this direction. The present Chief Commissioner, Mr. Cowper, I am able to say, is most ready to listen to suggestions; and when a deputation waited upon him some weeks back to point out the desirability of laying out the new streets so as to lead off to many points, and to gain the best advantage for existing buildings, as well as to open the view to new buildings in the best way, he requested the Institute of Architects to appoint a small committee to bring into form and to discuss these very questions, with a view to insuring the best attention to them. And this state of things—the representative of the Government, working with the

representatives of the lovers of art in carrying out great public improvements—is an encouraging guarantee that wisely-directed efforts will not be made in vain.

"London is not a 'show city'—not a place of European resort for pleasure and gaiety—but the great banking-house of the wide world, the busy mart of the universe, too much taken up hitherto with contemplation of its own growing prosperity, with very little care of external appearances, like a rich merchant, who, well knowing the filled coffers at his banking-house, cares very little for the threadbare appearance of his outward garb; yet there are spots which the busy citizen daily treads without observation, but which may well arrest the stranger, and must not be passed without remark.

"What can be more striking than the views of the great city from some of the bridges as you approach from the southward, especially London and Blackfriars bridges? Walk up Ludgate-hill, stand at almost any point about the Exchange, or in Holborn, where you can take in the view of the rising hill and some part of the broad roadway beyond; stand where the several great thoroughfares meet at the northern end of London-bridge, or look upward from the lower ground as you approach its southern end; and while from many of these positions you will see examples of architecture of which any country might be proud, mixed with buildings of the commonest character, and in the worst taste; you will, if you can look with the unaccustomed eye of the stranger, forgetting for the moment how constantly you tread these spots intent upon anything rather than giving them the least attention, you will see much to admire, much to be struck with as a whole; you will be conscious of a general impression as powerful as any you ever experienced when looking for the first time on great cities in other lands, and the imagination of the artist will find ideas the most suggestive and varied."

ON THE CONSTRUCTION OF A SICK ROOM.*

EVERY person who is able to erect his own dwelling should contemplate the probability of himself or those dear to him being at some time or other afflicted with sickness, or the subject of accidents, and should so prepare one apartment as to be most appropriate to that condition. When thus properly prepared and furnished, it may be commonly used as a bedroom.

Such an apartment should, where practicable, be so placed as to have only one end or side on the outside of the house, where the window is situated. The larger the room the better, if, in proportion to its size, conveniences for warming are added. If more than one side is towards the open air, the external walls should not be less than 14 inches thick, but 18 or even 21 inches is better. If of brick or stone, the inside should be rendered with Parian cement instead of ordinary plaster, which absorbs noxious gases and organic matter. The ceiling of panelled wood or well-matched boards stained of a light colour, and not painted. The Parian cement requires no paint. When a room is already built with ceiling and walls of plaster, the whole should be painted in a uniform light colour, or papered with a plain light satin paper without pattern. In fevers or nervous disorders, figures and patterns on the paper give rise to illusions which harass the patient and often prevent sleep.

The floor should be of oak with well-fitted joints, either dove-tailed or united with iron-hooping or plates slid into grooves in the edges of the boards. A strong cement, like marine glue, may be substituted for this, but not ordinary carpenter's glue. The joints and crevices of floors already laid may be filled with marine glue or cement, and the same should be done with crevices in the skirting.

The window or windows should be of plate-glass, the sashes opening both from above and below; they should be well-fitted, so as not to rattle in the wind, have box-shutters and good fastenings of such a kind as to require a key. In delirium, from fever or other causes, patients not unfrequently, in the momentary absence of an attendant, get out of the window. We should also recommend that on the outside a second window, flush with the outer face of the brickwork, should be added. This should be a French casement, opening like a pair of folding-doors, be well hinged, and when folded back against the wall, protected by a small fixed cornice. These outer windows may seldom be needed, but contingencies arise where they may save a patient's life.

A sudden fall of the barometer betokening the approach of a storm, shows us how great a change, inappreciable to the senses, takes place

* From *Household Medicine*, by John Gardner, M.D. Smith and Elder.

in the atmosphere, and this change is often enough to extinguish life when enfeebled by disease, particularly of the lungs. It would be interesting to collect the recorded instances of storms coinciding with the death of lingering invalids; we have noticed many.

To return to the inner window. The bars should not be less than two inches thick. Between the sash and shutter a groove, formed by two fillets, should be made to receive a gauze blind, strained on a frame, and from one-third to half the size of the whole window. As an open window is the best expedient for the ingress of fresh air, when the upper sash is drawn down, this gauze blind should be up so as to cover the opening. It admits the air, but excludes smoke and dust; when the gauze becomes choked (and it will both occasion surprise and prove the importance of this precaution to observe how soon this will happen, particularly in large towns), the gauze should be removed.

If there is one window only in a room, or if there are two or more, they should be so placed as to allow a bedstead to stand by the side, so as not to overlap the window space. When there is a choice, the aspect of the windows should be towards the north; but what is far more important, they should overlook a cheerful prospect—a garden or green fields.

The chimney should also be in the middle of a wall, wide and high.

If every other chimney-shaft in the house is neglected, that of the sick-room should be carefully plastered throughout the inside with good materials and a mixture of cement or plaster-of-Paris.

The ordinary pargetting is apt to crumble down after rains or frost; and we have known this to become a great annoyance to both sick and healthy persons, disturbing their rest and rousing them from their first sleep, to spend a long and sleepless night.

The chimney-shaft is the outlet for the egress of the air of the chamber, and with a fire is the best and indeed only successful ventilating apparatus yet invented. It has been suggested that the opening into the chimney should be high, on the assumption that a low chimney breast only serves to draw the air from the lower stratum in the room, leaving the large body of air above to remain unchanged, or rather to become contaminated by the products of combustion and breathing, so that a person standing or even lying in bed, breathes this foul air over and over again.

If a room is moderately lofty—say ten or twelve feet—this inconvenience will scarcely happen; the current through the fireplace up the chimney, aided by a natural law of interpenetration of airs and gases, soon renews the contents of the room—i.e., supposing fresh air in proper quantity finds admission. This may be readily proved by burning a piece of paper, or otherwise producing a visible smoke above the chimney breast. This difficulty about ventilation, however, may be entirely obviated by an opening constructed between the top of the fire-grate and the mantelpiece, and covering it with an open-work iron panel.

Another valuable adjunct to the chimney is obtained by carrying up an air-shaft by its side, in the brickwork; or, what is better, running up an air-flue, or tube of iron plates, jointed into the brickwork, is a very good plan. In any case it should have two openings into the chamber, both commanded by a valve or cover. One of these should be placed above the mantel—say about eighteen inches, so as to be readily reached—the other at the ceiling.

The fireplace should be an open grate of a good size, and rather low; no obstruction should ever be placed in the chimney throat to check the free flow of the air upwards. When gas is obtainable, the sick room should be fitted for this fuel; the grate filled with lumps of asbestos, or the coarse graphite obtainable at the gas-works, and numerous jets of gas playing upon these, make a cheerful fire, giving out great heat; not easily at first sight distinguishable from an ordinary coal fire. It possesses many advantages. It is kindled in an instant, increased or diminished at pleasure, requires no fireirons or supply of coals; and hence the noises attending on keeping up a fire are wholly avoided. It does not require the ordinary stove to be removed.

The chimney should be as open for this as for any other fire, in order that all the products of combustion should pass up with the current of air created by the flame. In this way all the objections commonly entertained against the admission of gas into bedrooms are obviated. It is quite a different thing in this respect to a gaselier without ventilation. The only valid objection to the gas grate is its expense. To warm a small room five hundred cubic feet of gas will be consumed in a day, and double that quantity will not more than suffice for a large room in the winter to burn night and day.

The gas grate of which we have been speaking must not be con-

founded with the gas stove. These, as they are commonly constructed, are highly objectionable in the sick room; the burning gas heats an iron plate, and this radiates and heats the air of the apartment. If, however, a gas stove is constructed on correct principles, so that all the products of combustion, and a strong current of air with them, are carried up a chimney, and the metallic case, which is heated by the flame, is so enclosed in an outer case or jacket, that the latter is heated only by hot air, and radiates a modified heat into the room, there is no apparatus so perfect for maintaining for a long period a perfectly uniform temperature. Such a gas stove may be made of sheet iron at a small expense; the consumption of gas is small comparatively, and if from eight to ten feet of piping is attached to it and carried up a chimney, its action will be perfect. It will not only warm but ventilate the apartment, and will prove invaluable for cases of prolonged indoor confinement, particularly in asthma, dyspnoea, chronic bronchitis, and consumption. We have known patients for whom a warm climate would have been prescribed, but who could not avail themselves of it, shut up for a whole winter in apartments warmed by a stove of the above description, and perfectly recover.

The door of the sick room should be fully two inches thick, hung on the best rising hinges, and fitted with good furniture, acting without noise. A second, or dumb door, swinging in the opposite direction, and covered with baize, should be included, in order effectually to shut out noises made by the household.

The fitting close of the doors is not of much moment. If air enough does not find its way in, an opening, or, what is better, several openings, fitted with slides to shut them at pleasure, should be provided over the entrance-door and by its side.

The additional cost of these arrangements beyond that of an ordinary apartment is too trifling to be worth consideration.

PROFESSOR SMIRKE'S LECTURES.

A SERIES of Lectures on Architecture, by Professor Smirke, has just been concluded at the Royal Academy. They were commenced on the 9th of January, and terminated on the 3rd April. The learned Professor has taken a very wide survey of his subject; and although our space will not permit us to report him fully, still the matter is upon the whole so excellent, that we shall present the gems of each lecture separately.

LECTURE I.

ART AND ARCHITECTURE IN THE SIXTEENTH CENTURY.

Early in the seventeenth century an Italian writer, Teofilo Gallaccini, composed a treatise of some ingenuity and merit, "On the Errors of Architecture;" and certainly he succeeded in bringing together a mass of architectural errors (horrors, I might say), so shocking as to reflect no small discredit on the practitioners of his day. That day, it is true, was one of great darkness in his art. By an unfortunate accident it coincided with the date of the greatest activity, influence, and wealth of the followers of Ignatius Loyola, when churches and seminaries arose in great profusion over a large part of Christendom; hence that era was then and still remains distinguished from all preceding and succeeding times by the prevalence of perhaps the worst architecture that has yet been devised by human ingenuity. Not that the Jesuit's style of architecture, as it has been called, may not be admitted to be sometimes picturesque and bold,—so much so, indeed, as to be occasionally most theatrical in its effects; but so entirely were all the rules of composition, I should almost say of common sense, ignored and outraged,—so entirely was the sober truthfulness of our art disregarded,—that I feel satisfied that I am confining myself to strict truth when I say that to the society founded by Loyola our art owes indirectly more of its degradation and decay than to any other school or individual whatever. Of course, I do not impute personally to himself any influence over the style which the buildings I refer to tended to propagate: I only regard him as the founder of a religious society, who became the unconscious instruments of establishing a vicious school of architecture at a very unfortunate epoch of architectural activity. The author to whom I have above adverted had the great merit of seeing more clearly than his contemporaries the faults of contemporary art; and he deserves to be recorded among our worthies for his boldness in contending against the monstrous errors and absurdities that had sprung up with a luxurious rankness and rapidity which are really remarkable.

The very commencement of the sixteenth century, namely, the age of Bramante, of Raffaele, of Peruzzi, and Giulio Romano, was, as I

have on a former occasion shown, in many respects worthy of being regarded as the culminating period of modern architecture; and the end of that same century saw the art, if not at its lowest ebb, at all events in a state of deplorable impurity. It is an old remark that all evil is but the corruption of what is good; and it seems to be in the nature of a law that no sooner has a point of excellence been reached than a process of deterioration commences. Fortunately, there would appear to be a co-existent law of social adjustment; for no sooner have we reached a state of apparently hopeless and helpless imbecility, than a glimpse of better things appears to restore our hopes and to redress the balance. The course, in short, of most human affairs, may be correctly represented in a diagram by a series of anticlinal lines, persistent in their ever-varying irregularity.

Such, at all events, appears to have been the course of our art. The great effort of the distinguished artists whom I have named appears to have been—first, to make themselves thoroughly acquainted with the principles which guided the architects of the great Classic period, and then to devise such departures from the style of that period (still, however, adhering to the principles on which that style was founded) as would enable them to adapt their structures to the greatly altered habits, and to the new civilization, of their own days.

There can be little difference of opinion among us as to the consummate genius and wonderful dexterity with which these modifications of the ancient manner were effected. Perhaps one of the most prominent modifications was the introduction of a regular fenestration, by which that essential feature, the window, was so treated as to render it a fertile source of beauty and interest. It is true, evidences are abundant to prove that, whatever may have been the case in still earlier times, windows, with their architraves and other somewhat ornamental adjuncts of like nature, were a recognised feature in Roman architecture; but I am aware of no ancient building having its various floors marked by uniform ranges of windows as decorated features, such as we find especially characterizing the architecture of the Renaissance.

Another source of beauty, wholly unknown to Classic art—namely, the balustrade—is also due to the originality and inventive genius of the quattro-centists; and it is curious to note the avidity with which artists learned to avail themselves of this novel and ingenious mode of turning so prosaic and utilitarian an object as a parapet into an ornament of great æsthetic value.

The systematic superposition of several regular orders was another practice particularly affected in renaissance architecture. It had, indeed, been suggested by the magnificent amphitheatres of the Romans, as well as by a rare instance or two of still earlier date, but was certainly not practised by that people generally, either in temples or in their domestic buildings. I have enumerated some of the more prominent characteristics of Italian art which stamped it with originality, and gave birth to a school as widely differing from the primitive, strictly Classical school, as from the Mediæval school, which it supplanted.

Such was architecture at the beginning of the sixteenth century in Italy, then the instructress of Europe in the fine arts, as well as in most other branches of intellectual culture.

To inquire why art decayed after it had arrived at a point of great excellence is, perhaps, equivalent to inquiring why genius is erratic, why we are unstable in our judgment, and why human fancy is like the fabled bird of Paradise, that exists only when on the wing.

Had the men who followed the bright period to which I have adverted been plodders on the highway of art, without soul or invention; and content to follow with painful exactness the footsteps of their predecessors; we might, perhaps, have seen an age of good imitators, and of a level platitude; a race of tame transmitters of the excellence of others, productive of a perpetual repetition of approved forms and established models.

But very far otherwise was the case. Art, in all its branches, throughout the sixteenth and even the seventeenth century, was in a state of excitement and activity. Vasari, writing in the middle of the sixteenth century, vaunted that such was the fecundity of art and facility of execution in his time, that six pictures could then be painted within the time occupied by the previous generation of painters on a single picture. The simple-minded historian of art seems to have been hardly aware that his vaunt implied rather reproach than praise; although it is true he has elsewhere amused his readers by the anecdote of an eminent painter who, at his easel, when called to his meal, replied that he would come directly, "for he had but one saint more to paint."

The real laborious artists of the fifteenth century wrought, no doubt,

slowly and painfully—urged onwards not so much by a thought of lucre or applause, as by a deeply-felt love of their art; whilst the flattering crowd of artists who filled the scene in later times were the spoilt children of fortune; painting and carving and building with wonderful dexterity and readiness of execution, it is true; and with a wonderful facility of invention in devising new shapes and fashions and fantastical combinations; but without that earnest, ardent, painstaking, and simple severity of study which had conducted their forefathers to real excellence.

By way of illustrating the vast change that had taken place during the sixteenth century, let us compare the works of Bramante, who flourished at the beginning of that century, with those of Borromini, who was born at the end of it. I have on a former occasion dwelt on the peculiar merits of Bramante. His was a pure, honest architecture, perfectly free from affectation and conceits of any kind whatever. His style appears to me to be all the more captivating from the very absence of all *ad captandum* contrivances, and all the more effective from its manifest freedom from all seeking after effect.

If we turn from him to Borromini, we shall be shocked to see what devastation and corruption of taste had taken place during the one hundred intervening years.

The one sought to charm by his purely architectural feeling; aiming, for the most part, at those high qualities—order, symmetry, and rhythmic arrangement—which the great father of architecture, Vitruvius, had long before pointed to as the distinguishing character of good architecture; whilst the other set at defiance all order and moderation. The one never feared to draw a straight line, unless the requirements of his work seemed to render a curved or a broken line preferable for some special purpose; and surely a straight line seems to be, of all others, the line of architectural fitness, and therefore of beauty; whereas Borromini must evidently have abhorred such a line above all things. He it was who, of all men, contributed most to the introduction of that system of architectural design (if it can worthily lay claim to the dignity of a system) by which masonry lost its special character, and its most appropriate forms. His façades curved inwards or bulged outwards on their plan, as if made not of hard stone, but of some yielding and plastic substance; and his pediments, totally forgetful of their primitive form, offered every variety of intricate convolution and distortion.

Bramante called in the aid of sculpture with that chariness and caution which plainly indicated how highly he appreciated its noble attributes and fitting application; and as if he feared to vulgarize it by too frequent a use of it, or by excess of any kind. Yet, highly as he appreciates sculpture, he never permitted it to encroach upon the proper limits of his own special art. Sculpture was used by him as an honoured accessory, well calculated to stamp a moral value on his work, and to give it a grace beyond the reach of mere architecture.

Borromini, on the other hand, permitted sculpture to dominate over the main object of his art without restraint: his whole building was literally sculptural, and his masonry was left to the humbler duty of forming a mere vehicle for the consolidation of some fantastic piece of clay modelling. Such had been the downward progress of architecture during the period to which I have been adverting.

It is worthy of note how great a sympathy has always seemed to exist between our art and that of the sculptor. Whether dignified and severe, noble or mean, natural or conventional, grand or grotesque, those two sister arts seem ever to have proceeded hand in hand; for ever sharing the same fate; rising together into greatness and sublimity, and together sinking into painful imbecility. Without going too far back into the history of art (although in remotest times the sympathy between the two arts was eminently conspicuous), we shall find the observation hold good in Mediæval art. The culminating period of ecclesiastical architecture was precisely that which has been eulogized by our Flaxman as distinguished by high sculptural excellence. The quattro-centist introducers of modern art in both these branches shared like feelings, and were remarkable for like excellences. The sculpture of Donatello, like the architecture of Alberti, was alike vigorous and original, and full of delicacy of feeling; these high qualities being in both arts somewhat qualified, it is true, by a certain degree of hardness and rigidity. In Michelangelo we find the same colossal and masculine breadth, whether we regard the examples he has left us of his sculpture or of his architecture.

Then coming down to the epoch that more particularly engages our attention this evening, we shall find the same debasement pervading the two arts. I have already said that one of the marked characteristics of the architecture of the seventeenth century was that of

restless movement; so also the sculpture of the seventeenth century exhibits, in an especial manner, the absence of that tranquil dignity which is particularly becoming in sculpture, especially when applied as an accessory to architecture. A want of repose is almost equally offensive in both the arts. The eye is fatigued and the attention distracted by an excessive flutter in the details, whether we contemplate a building or a group of sculpture. Bernini set the example, but Borromini went far beyond him in this vicious treatment of the sculptural accessories of their respective buildings. Indeed, one of the most repulsive faults of sculpture at this degenerate period was its utter want of repose and the inordinate love of representing agitated drapery.

To say the truth, without, however, meaning the slightest disparagement of the sister art, I would express my belief that most of the errors of architecture, in its decadence, may be traced to the injurious influence that sculpture exercised over our art. The habit of a sculptor's mind would naturally lead him to exercise his inventive faculties in designing and modelling, out of the plastic material with which he is most familiar, forms and combinations of forms that would produce picturesque groups, and an ornamental or at least pleasing arrangement of lines, and of chiaroscuro; and, when he comes to execute his conceptions in stone or marble, he would of course seek to construct his work, if not out of a single block, at all events in as few as possible; because joints, and especially bed-joints, he is of course always anxious to avoid or conceal. All the proprieties, therefore, of *masonic construction*; the sound bonding together and truthful bedding of stones; the avoidance of false bearings, and all such-like considerations, are entirely foreign to his art; and are, in fact, subjects which never, or rarely, demand his study, nor even need his attention *as a sculptor*. Hence it is, probably, that we find that the sculptor of the seventeenth century, when he produced works of architecture, was very prone to treat his buildings, however large, rather like magnified copies of small sculptural models, than as purely architectural works; that is to say, works built up on the true principles, and according to the known rules, of good architectural construction.

I think that it may be said, with strict truth, that exactly in proportion as this sculptural spirit pervaded architecture, so that art became deteriorated. It has been truly said, by a high authority from this place, that painting and sculpture each excite our admiration the most when their special characters are kept most clearly defined, and when each art limits itself to the doing that which it is by its nature best qualified to do. Sculpture can very imperfectly represent distance; and should, therefore, avoid as much as possible attempting backgrounds. Painting, on the other hand, is peculiarly competent to produce such effects, by its power to represent space and distance; and, therefore, the painter who places all his figures on the same plane does not avail himself fully of the capabilities of his art. So, also, the painter abandons one of his highest privileges when he neglects to use colour; whilst the sculptor who uses colour (unless he does so with infinite caution and exercises great moderation and abstinence) runs a serious risk of turning his statues into dolls.

Our own art is amenable to the same law. It is always most triumphant when it attempts to do that only which it is its special province to do. Thus, then, to apply our remarks to the subject in hand, I should say with great confidence that the architect who so designs his building as to render it doubtful whether sculpture may not legitimately lay claim to the work as its own, is a traitor to his art, and despoils it of its birthright.

DO MOULDINGS IMPROVE ARCHITECTURE?

ARCHITECTURE, to be of any value, must embody in itself the highest, noblest, and purest form of thought of the age in which it is built. It should not be an impersonation of the common sentiment of the age; because that, with few exceptions, is morally bad; man, in all ages alike, being an imperfect being, with but little control of his passions. Popular literature is only a slight guide to the feelings of the age: sensation novels do not represent the actual sentiment of men in 1862. We are anything but sensational in our intercourse with one another; but they show this, that our lives are so conventional and unnatural, that we are the victims of fashion, and mere machines; and that, in order to be pleased in our leisure hours, we must have something unnatural and overstretched.

On the opposite side, we have a school of naturalists in art, politics, and philosophy. The critical spirit of Germany is of this school.

The whole tendency is to ascertain the true and beautiful by the most natural laws of reason. It is certainly the healthy side of our age; and, if too material to produce any great sentiment, like the thirteenth century, it has, at any rate, its good points. It is the age of reason. The twelfth and thirteenth were the ages of faith.

Before we proceed further with the inquiry, we will just glance back at those twelfth and thirteenth centuries. They were noble ages. Although religious ages, inasmuch as men confessed a faith and did not doubt that faith, they were no more pure morally than the present age of reason, from man in all ages being the same weak creature, unable to govern himself either by faith or reason. Were men more romantic in their characters than now? On the whole, very little. Men in the present day run willingly into danger in the same way as then, and the idea of everybody fighting for his faith, and only for it, is now exploded. The proportion of religious Crusaders was certainly small. The romance of the Middle Ages was more the character of the literature than of the man. It was, in fact, the noble literature, the great poem of the Early Mediæval age, that was romantic: the men were robust, hard, veritable men; open, and generally opposed to meanness; and, when touched upon at certain moments, religious in their faith, and fond of the romance as sung to them by the bards. They were exceedingly fond of fighting and plunder: they were consequently hardy men; and as the opposite to this they respected woman, but they did not trust her; and apparently she was not very chaste,—exceedingly frail then as now. A really good woman seems, at least in the romance, to have been rare. "The Niebelungen Lay," "The Metrical Tales of King Arthur," and the "Romance of France," contain examples of the contrary in great abundance, but very few good. Man or woman, it would be who could combine feeling and reason equally! But, perhaps, woman would lose her charm as woman, were she critical like Bunsen. The twelfth-century men being robust men, they built strongly. The sentiment of their sculpture was purely natural: there was no sought-for sentiment, no imaginary sentiment, and consequently false, as we find in Sassoferato, or in another form, in modern German art? It was very natural, like their romance: it was a purer form of their own life. Now, what is to be the sentiment embodied in modern art. The higher form of the age is reason. Hence we build, or should build, a strong architecture,—a pointed arch, because it is strongest. Our ideas of beauty are those which reason has pointed out: nature is our idea of beauty. Hence the sentiment of expression in our sculpture and painting must be strictly natural, with as much feeling as our reason will admit us to throw into it, and as pure as we can make it. As before said, reason is the higher principle of the age; the trait our great thinkers admire: that the lives of men in the year 1862 are reasonable, no one after five minutes' thought will admit. The lives of men are selfish: they never were more selfish than at present. Doing good to others forms a very small part of the general daily occupation of this gold-hunting age. Charity does not consist in a millionaire giving 500*l.* to an hospital, but in doing or giving something which is really a sacrifice of one's personal comfort. It is not exactly a manly age; yet the best form of modern man is an admirer of manliness, and consequently a lover of nature. Shall we get the feeling into sculpture, as the twelfth-century men did? I think not; simply because we do not believe as they did. If a man has got the simple faith of one of that age, he will not be able to give that feeling. But we are a doubting age, full of reason, without feeling. I speak of the thinking class. They were a robust age, but full of faith and feeling, with little reason. They built strongly, because they were hardy men: we build strongly, because it is more rational. Thus I believe that, although we gain much, we must lose much; because much feeling cannot exist with much reason. However, let us see how much faith and feeling we can get into this age of reason. I am afraid it will be but little. Our Roman Catholic friends ought to aid us in this matter; they are living in the age of reason, but they have much faith: they ought to produce some good art, when they have an opportunity to build a church on anything like a large scale. Pugin possessed a great deal of both elements, but art was not then so advanced as now: as regards the workmanship, he could only form workmen out of bad elements: now there is a body bred up in good principles. At any rate, our architecture must be massive: now mouldings, tracery, mullions, corners cut away for pillars, crockets, and the like, take away from the massiveness. Let our architecture be thick and manly: mouldings are neither massive nor manly. Let the architecture of the day be a moral lesson to us, better than ourselves. That man had any notion of the pointed arch being the strongest and best, when he

introduced it in the thirteenth century, I think not: he adopted it as a matter of taste: it was some development of an idea he had got elsewhere; perhaps in the East, because no sooner was the pointed arch introduced than architecture began to decay: it became thin, full of mouldings, tracery, and went on getting worse, through the Decorated and Perpendicular periods. This shows that there was very little reason in the Gothic architect: he had no sooner got the strongest and most perfect form of arch than he began to thin and cut it away: this is a lesson to our generation. Our duty it is to be as massive, strong, and constructive as possible. We are guided by reason: he adopted the pointed arch as a question of taste: we adopted it because of its strength. The twelfth-century man was hardy and robust, and built accordingly; but directly he took to Pointed, he began to give up these traits, and lost himself in thinness and complications of mouldings. The expression of art, too, sculpture and painting, lost its vigour: there was not that hardy purity in the fourteenth, there was in the twelfth; they began to set up their own ideas in preference to nature. A Madonna and Child of the fourteenth, compared with the same of the twelfth, is like modern German Dusseldorf art, compared with Rossetti or E. B. Jones: it is conceit compared with honest English nature. What we must combine in our age, then, is the strongest form Pointed, with the massiveness of the Romanesque; and this combination must exist, because it is most in accordance with reason. As to our sentiment, it must be thoroughly natural, reasonable, with so much of passion and feeling as our rationalistic age will permit.

ALPHONSE WARINGTON.

THE ARCHITECTURAL EXHIBITION.

It was to be expected that the desirability felt by architects to send illustrations of their works to the International Exhibition, would interfere with the annual exhibition in Conduit-street; and the matter for wonder is, not that there are fewer drawings in the latter than usual, but that there are sufficient to make an exhibition with any interest at all. The preparation of a drawing *fit* for exhibition implies the expenditure, by the architect, of a certain amount of money, or of time that is equal to it; in some cases a considerable amount; and the advantages resulting to the man already known and in good practice, are not sufficient to carry him more than a certain distance in that direction.

The amount of art shown in the collection is not large, even with reference to the number of the works exhibited; and some of the drawings might have been retained in the office of the author without loss to the public. It is the duty of the profession to continue to maintain this Exhibition; and we shall hope next year to find a larger number of contributions from the elder members of the profession. The great feature of the present Exhibition is the collection of sketches and designs by the late A. W. Pugin. These might have been better arranged. They afford a good lesson to all young architects, and should be studied.

Photographs of Pugin's Sketches are to be published, it appears, in bi-monthly parts; at too dear a rate, however, to justify the expectation of any large sale.

To the general Exhibition, Mr. E. B. Lamb is probably the largest contributor; sending schools, houses, and churches; all thoughtful, and mostly appropriate. His "Warehouses for the Consignment and Store Company" (No. 40) are almost monumental. Mr. Burges shows his skill in Mediæval figure drawing by photographs of sculpture, executed from his designs. The "Elevation for Town Hall, Hull" (7), and that of "Town Hall, Northampton" (8), now being erected, both by E. W. Godwin, are very similar; being adaptations of that description of Italian-Gothic, involving as a striking feature statues on brackets between the windows, which is just now being reproduced on all sides. We do not say this, however, in disparagement of the architect in question, who has a power of his own. The curious condition of architecture amongst us is shown by the circumstance that the design for the first-named Town Hall (Hull), to which the first premium was awarded, exhibited here by Green and De Ville (28), is a full-fledged Corinthian building; and the design for the second (Northampton), "to which the first place was awarded by the professional referee" (185, Louis De Ville), is Corinthian and Doric. The fact is, we have not yet an architecture of our own; and, in the way we are now going on, it will be long before we shall have it. The last-named architects, Green and De Ville, exhibit their design for pro-

posed Palais de Justice, Brussels, to which the third premium was awarded (205, 210, and 225): this we shall illustrate. (12), "Redhill Market Hall," T. and H. Francis, is too much like a private residence: it would be entirely so but for the clock in the porch. In like manner (212), "Design for the Public Halls, Guildford," W. Lightly, fails to convey its purpose. (15), "Godolphin Schools, Hammersmith," C. H. Cooke, we have already engraved. The tower shown in the view now exhibited has not been built. Our engraving represents the building as erected, without it. (20), "Offices and Sale Rooms, Water-lane, City," John Whichcord, have the great merit of plenty of light. (24), "Slip Roof now erecting at Millwall, for Messrs. Mare, for building Iron-cased Frigates," James Edmeston, is a satisfactory piece of iron framework. The same architect exhibits a view of "Messrs. King's premises, 77, Thames-street," a very lofty pile, with pointed red brick arches, and picturesque arrangement of louvres on roof. The number of red-brick arches, by the way, in the collection is *very* considerable. (45) includes three graceful "Sketches in France," by R. Phené Spiers. (46), "St. Patrick's Cemetery, Low Leyton, Essex," Willson and Nicholl, shown by photographs. The buildings, Early Pointed in style, are appropriate and pleasing. The same gentlemen's "Studies for the High Altars in Churches of St. Charles Borromeo, Upper Ogle-street, London, and of the Augustinian Fathers, Limerick" (59), show knowledge and right feeling.

One of the best specimens of colouring in the rooms is No. 62, "Cathedral of St. Asaph, the Choir," J. Burbidge. We recognise the same gentleman's colouring in some of the other drawings here exhibited. (63) is one of Mr. Truefitt's characteristic houses "just erected at Hornsey-rise." (71, 72, and 73), C. J. Phipps, are some designs set forth in wild pen-and-ink scratches, which would disguise any idea, however good. (76, 114, 178), "Buildings designed and Buildings executed," J. P. Jones, show a fatal facility in recombining two or three of the fashionable elements, red-pointed arches and our friends the statues on brackets: we willingly recognise, nevertheless, a considerable amount of cleverness; (86) is a "Design for an Octagonal Vestibule with four Porticoes to Government Offices at the crossing of two main thoroughfares," which the intelligent author of it, C. H. Smith, would be sorry to see carried out. Why put porticoes in a vestibule, when he would put down his own umbrella as soon as he reached it? (89), G. Goldie's solid-looking church at Greenock, we have already illustrated. (93), "Sculptural and Architectural Studies from Miraflores, Castille," J. B. Waring, show his great facility with the pencil and on stone. (95), "Designs for St. Michael's Schools and Lecture Hall, Handsworth, near Birmingham," S. C. Rogers. Although entirely plain and simple, its proportions, and the largely-overhanging roof on iron cantilevers, give it a distinguishing character. (108 and 109) are the section and elevation (not quite agreeing, by the way) of the design for an Exchange for a large commercial city, for which the Royal Academy awarded the gold medal last year to Thomas H. Watson. The style is Italian Gothic, showing that timidity in the mouldings which characterizes it. The drawings are beautifully executed. Mr. I'Anson sends a pen-sketch of "The Château of Chambord" (25); and "A Villa at Dulwich" (30); Mr. Roger Smith, "The Design submitted in Competition for Hospital of Incurables" (125), which we mentioned at the time as the only one having the Gothic character; Mr. T. C. Clark, a very good drawing of the Presbyterian church he is now building in Upper-street, Islington (210); and Mr. Vaughan some of the excellent sketches he made abroad as the Soane medallion student of the Royal Institute of British Architects. Mr. Ashpitel, Mr. Brodric, Mr. Joseph Clarke, Mr. Fowler, jun., Mr. Hadfield, Mr. Homann, Mr. Knightley, Mr. H. Oliver, Mr. Seddon, Mr. Shout, Mr. White, Mr. Wilkinson, and others, also exhibit, and aid in rendering the collection fully deserving of a visit.

The catalogue, we must mention, has a ragged and disjointed appearance, which might probably be remedied. Some little control, too, should be exercised over the descriptions inserted by manufacturers and companies.—*Builder*.

[We shall give a more general and extensive notice of this Exhibition next month.]

INSTITUTION OF ENGINEERS IN SCOTLAND.—The proceedings of the sixth meeting of the present session of this institution have been printed. They comprise papers "On Veneer-cutting Machinery," by Mr. Whitesmith; "On Moveable Bridges," by Mr. D. McCall; and "On the Expansive Working of Steam," by Dr. Macquorn Rankine; together with discussions on the various papers, and on that of Mr. J. F. Spencer, "On Surface Condensation."

ON SOME OF THE SPIRITUAL SIGNIFICATIONS
OF GOTHIC ART.

THE following eloquent and thoughtful remarks on Gothic Architecture are from the "History of France," by M. Michelet. This author is best known in England by his assaults upon the Jesuits, and by his semi-mystical, semi-political tract, called "The People," and of late years by his disgusting work upon woman. But M. Michelet has far other merits than are discoverable in any of these productions. As a historian, he is one of the most conscientious, catholic, and painstaking. He is, moreover, like our own Mr. Ruskin, whom in his glowing picturesqueness of style he greatly resembles, animated by a fierce hatred of the materialism of his age, and like the author of "The Seven Lamps of Architecture," he has a true appreciation of, and ardent sympathy with, the profound earnestness, child-like simplicity and faith, which were the most striking characteristics of the great men of the misunderstood and maligned Middle Ages.

"Architecture rests on two ideas: the natural, or the idea of order; the supernatural, or that of the infinite. In Greek art, order directs and guides the natural and rational idea. The strong Greek column, elegantly grouped, bears at its ease a light pediment—the weak rests on the strong; this is logical and human. Gothic art is supernatural, superhuman. It is born of the belief in the miraculous, and poetic up to absurdity. I speak not in scorn, but after the words of St. Augustine, 'Credo quia absurdum.' The divine house, because it is divine, needs not strong columns; should it accept material support, it is in pure condescension; the breath of God is all it requires. If possible, it will do without any supports of the kind. It will delight in rearing enormous masses on slender pillars. The miracle is clear. This is the vital principle of Gothic architecture; it is the architecture of the miraculous. But it is likewise its principle of death. The human miracle imperfectly fulfils the condition of the miraculous. The idea of the miraculous is that of an instantaneous act, of a *fiat*, of a sudden assistance granted to the necessities of mankind; it is then sublime. A regular miracle, like the course of the sun, becomes common and unnoticed. An immovable petrified miracle, proceeding from no urgent necessity, strikes as an absurdity. Love loves to believe in the absurd; it is an act of devotion, of self-immolation the more: but the moment love shall become wanting, the strangeness and oddity of these forms will be obvious, and the sense of beauty will be shocked quite as much as the sense of logic.

"The Gothic style—produced by the effort of mysticism—is what some have called, without understanding it, the free style. I say free, and not arbitrary. Had it kept to the fine type of Cologne, had it remained submissive to geometrical harmony, it would have perished of languor. In other parts of Germany, and in France and England, being less controlled by arithmetical rules and religious idealism, it received more fully the impress of history. As German jurisprudence when transported to France lost its symbolical character, and took one more *real*, historical, variable, and susceptible of successive abstractions; so Gothic art lost in France somewhat of its divinity, and came to represent, along with the religious sentiment, all the vanity of actual circumstances, of men and of the times. German art, more impersonal, has rarely named the artists; ours have marked our churches with their ardent personality; we read their names on the walls of *Notre Dame de Paris*, on the tombs in Rouen, on the tumular stones and the mazes of the Church of Rheims. Anxiety for renown, and rivalry, impelled these artists to desperate deeds. At Caen and at Rouen we find parallels for the story of Dædalus killing his nephew through envy. You see in a church in the latter town, the hostile and threatening effigies of Alexander de Berneval and of his pupil, whom he poniarded. Their dogs, crouched at their feet, still threaten each other. The unfortunate young man, in the sadness of a destiny unaccomplished, bears on his breast the incomparable rose in which he had the misfortune to surpass his master.

"It is the very essence of art to be disinterested, to be to itself its proper object: then Gothic art was less art than was that of Greece. The latter aims at the beautiful, nothing more. It is a young art, which finds its full satisfaction in form. Gothic craves the good and the holy: art is here as a means of religion, as a moral power. Art in the service of a religion of death, of a system of morals which prescribes the annihilation of the flesh, must encounter and cherish ugliness. Voluntary ugliness is a sacrifice, natural ugliness is an occasion of humility. Penitence is ugly, vice still more so. The god of sin, the hideous dragon the devil, is in the Church, vanquished, indeed, and humbled, but at any rate he is there. The Greek style often makes the brute divine; the lions of Rome, the steeds of the Parthenon, have

remained gods. Gothic bestializes man, to make him blush for himself before making him divine. Here is Christian ugliness. Where is Christian beauty? It is in that tragic image of mortification and woe, in that pathetic look, those arms opened to embrace the world. Terrific beauty, adorable ugliness, which our old painters feared not to present to the sanctified soul. Must it be that a time shall come when man looks in it for something else, when he prefers the graces of life to the sublimity of death, when he carps about the forms of the God who died for him?

"In all Gothic art, sculpture, and architecture, there was, we must confess, something complex, old, and importunate. The enormous mass of the church is propped by innumerable counter-forts, and laboriously upraised and sustained, like Christ on the Cross. It is wearisome to see it surrounded by countless struts and stays, that give it the appearance of an old house that threatens to topple down, or of an unfinished building.

"Yes, the house was toppling, it could not be finished. This art, assailable in its form, failed also in its social principle. The form of society whence it sprang was too unequal and too unjust. The system of castes, however attenuated by Christianity, still subsisted. The Church, sprung from the people, was soon afraid of the people, shunned it, and made alliance with its old enemy, feudalism, and then with royalty, when this was victorious over feudalism. It then took part in the melancholy victories of royalty over the Commons, to the birth of which itself had lent its aid. The cathedral of Rheims displays at the foot of one of its belfries the image of the bourgeois of the fifteenth century, punished for having resisted the imposition of a tax. This image of a pilloried people is a brand upon the Church herself; the voice of the sufferers rose with the chants. Did God gladly accept such homage? I know not, but it seems to me that churches built by *corvées* (forced labour) raised out of the tithes of a famishing people, all blazoned with the pride of bishops and lords, and filled with their insolent tombs, must have become day by day less pleasing to Heaven. Beneath these stones there were too many tears.

"The old world must pass away, the last trace of the middle ages must become fully effaced; we must behold the death of all we loved; of what suckled, of what was our father and our mother, of what sang us so sweetly in our cradle. In vain the old Gothic church lifts evermore to heaven its suppliant towers; in vain its storied windows weep, its saints do penance in their stone niches. 'Though the waters of the great deep overflow, they will not reach the LORD.' This condemned world will pass away with the Roman, the Greek, and the Oriental worlds; it will lay its bones by theirs. God will grant it, at the most, as to Hezekiah, one round of the dial.

"Alas! then, is it all over? Will there be no mercy? Must the tower halt in its soarings towards the sky? Must the spire fall back, the dome topple down on the sanctuary? Must this stone heaven sink down and press on those who adored it? Is all at an end when the form is at an end? Is there nothing for religion after death? When the cherished remains, snatched from our trembling hands, descend into the grave, is there nothing left? Oh, I put my trust for Christianity and Christian art in that very phrase which the Church addresses to her dead:—'He who believes in me shall never die.' LORD, Christianity has believed, loved, comprehended; GOD and man have met in it. It may change its garb, but perish never. It will become transformed, to live again. It will appear one morning before the eyes of those who think they are gazing on its tomb, and will rise again on the third day."

THE MEDIEVAL COURT AT THE INTERNATIONAL EXHIBITION.—The court for the exhibition of Mediæval art is on the north side of the nave, not far from the eastern dome, and promises to be a very attractive feature. It will be remembered that the Ecclesiological Society obtained space for such exhibition; and since then various other exhibitors in the same walk, to whom space had been allotted, have joined with the Society, and given them the general control and arrangement. We could print a considerable list of modern monuments, screens, sculptures, metalwork, and furniture, which will be found there; but think it better to wait. The National Committee for Architecture has also the control of a court for the exhibition of architectural art-manufactures, of all styles, situate in the east transept; and here, too, are the galleries of the special Architectural Exhibition, comprising drawings and models.

NOT BAD.—The *Cleveland Herald* says, the mortar-boats of the Mississippi are carrying the cement of the Union down South.

REVIEWS.

THE RESTORED TOMB OF MAUSOLUS.*

THE discovery and restoration of the world-renowned tomb of Mausolus in the reign of Queen Victoria have brought this "seventh wonder of the world" within the scope of our periodical. The conjugal affection of Queen Artemisia, and the magnificent embodiment of her sorrow and love through the genius of Scopas and his fellow-labourers, have rendered the restored glory of Halicarnassus a theme for all time. "A thing of beauty is a joy for ever," and the masterpieces of genius are the everlasting inheritance of the whole human race. Two-and-twenty centuries have elapsed since Mausolus died. Britain was then a land unknown to the civilization of the world, unless perchance through the wild and wondrous tales of the Phœnician mariners. Its inhabitants were for the most part a skin-clothed, woad-stained, man-sacrificing, idol-worshipping, savage, priest-ridden race. Nothing that the human mind can conceive seemed more unlikely to take place than that a native of this mist-shrouded, obscure ocean isle, should have excavated the ruins of the once proud capital of Caria, discovered the site, and determined the size and the form of the monument which ranked as one of the "seven wonders of the world." The advent of the artistic New Zealander who is to take his stand upon a broken arch of London Bridge in order to sketch the ruins of St. Paul's, is, as a poetical conception, infinitely less extravagant to us, than the prediction that a native of barbarian and all but unknown Britain, animated with the love of art, should visit the site of Halicarnassus, and restore the tomb of Mausolus, would be to an intelligent Greek of the fourth century before Christ. Thanks, however, to the evolutions of the ages, the wonder-working power of time, by which nations are born and empires overthrown—which humbled Greece, and elevated the then savage and insignificant isle of Britain to the foremost place among the nations of the world—and thanks, also, to the liberality of the British Government, the intelligence, enterprise, and perseverance of Mr. Newton and his fellow-worker, this marvel, greater than the advent of the artistic New Zealander, has been accomplished. The grave has given up its dead. The might of the human mind has for once at least successfully wrestled with the great destroyer. A vanished glory of the past is made visible to the present. More than Layard has done for Nineveh, or Botta for Khorasabad, or Davis for Carthage, or Niebuhr or Bunsen for old Rome, Mr. Newton has done for the buried capital of Caria, and the lost tomb of Mausolus.

This gentleman, and his friend Mr. Pullan, the architect of the expedition, are more than mere antiquarian or historical discoverers. They have shown not only where the lost "wonder" once stood, but what it was, and how it looked. Its form and size are clearly displayed and incontestably proved. After their demonstration, the confused but valuable description of Pliny, and Littré's surmised emendations, need no longer bewilder the mind of the antiquary or the student. The scattered and broken fragments are gathered and reconstructed, and the monument of the Carian King, with its spacious marble pedestal, its majestic quadrangle, with its screen of stately columns, surmounted by a pyramid and crowned by a chariot and statue, all of Parian or Pentelic marble, stands (to the mind's eye) once more "a star y-pointing pyramid," gleaming and resplendent, like a structure of sunbeams, beneath the blue sky of the glowing Orient, in the midst of the busy city, surrounded by the fields and the hills covered with the olive, the vine, and the fig-tree.

The main historical facts connected with the Tomb of Mausolus, and the circumstances which led to its discovery and restoration in our day, may be briefly stated. The Mausoleum was built about 350 years before Christ. It was standing so late as the tenth century of our era. This preservation was in all probability owing to its being a tomb, not a temple, which would have exposed it to the destructive fury of both Moslem and Christian iconoclasts. When it first fell into ruin is not known. There is reason to believe that the downfall of the upper part was effected by an earthquake. In 1402, the Knights of St. John took possession of Halicarnassus, and used the marble of the Mausoleum to build the fortress of St. Peter on the rocky peninsula of the harbour. In 1522, Sultan Solymán having prepared to lay siege to Rhodes, the same Castle of St. Peter was repaired by the white marble steps of the Mausoleum. Other depredations followed; and "thus," adds Guichard, who wrote in the sixteenth century, "this magnificent tomb, which ranked among the seven wonders of the world,

after having escaped the fury of barbarians, and remained standing for the space of 2247 years, was discovered, and destroyed to repair the Castle of St. Peter by the Knights of Rhodes, who immediately after were driven out of Asia by the Turks." For the sake of honest Guichard's indignation at the Vandalism of the Christian knights, we are content to forgive his error in the computation of the time during which the Mausoleum stood. The next notice we have of it is in the French traveller, Thévenot, who visited Budrum (Halicarnassus) in the seventeenth century, and observed certain slabs in low relief, extremely well sculptured, which were inserted in the walls of the Castle. Occasionally notices of these slabs are to be found in the works of other travellers from the time of Thévenot until the present day.

In 1846, Lord Stratford de Redcliffe obtained a firman from the Sultan, authorizing the removal of these marbles from the walls of the Castle, and presented them to the British Museum. Of these sculptures Mr. Newton, assisted by Mr. Cockerell, R.A., drew up a memoir, in which it was attempted to determine the site of the Mausoleum. While engaged in this work, Mr. Newton became convinced that for the complete elucidation of the sculpture more evidence was necessary, and that this evidence must be sought, not in books, but at Budrum itself. In 1855, Mr. Newton visited Budrum, and then "made the remarkable discovery which induced Her Majesty's Government to send out the expedition forming the subject of this work." The discovery here referred to was that of several colossal lions in Parian or Pentelic marble, and in the finest style of sculpture, inserted in the walls of the Castle. These lions, on historical evidence, he concluded to belong to the school of Scopas and his illustrious fellow-labourers in the work of decorating the Mausoleum. Mr. Newton's application to the Government for the means of conducting the investigation on which he had resolved was successful, and the expedition, which resulted in the splendid volume of illustrations now before us, commenced in October, 1856, and terminated in June, 1859.

For the detailed narrative of the labours and discoveries which have eventuated in the restoration of the monument of Mausolus, we must refer our readers to the volume of letter-press descriptions which accompanies the volume of drawings. For the present our task must be limited to a brief account of the contents of the volume of illustrations, and of the crowning triumph of an exploration unsurpassed for the intelligence employed in its conduct. This crowning triumph, it need hardly be stated, is the restoration of the Mausoleum. The science and the success of Mr. Pullan in this undertaking deserve to rank with Cuvier's or Owen's in determining and constructing the complete anatomical structure of an extinct animal from a few broken and disjointed bones. With no more architectural aid than about twenty "varieties" of damaged stones, he has succeeded in giving what every competent authority considers to be a full and faithful representation of this long-lost "wonder of the world." The process of this restoration and the proofs of its accuracy reveal an amount of patient intelligent industry which is positively astonishing, and constitutes in its perusal one of the most interesting, we might even say entrancing, chapters in the romance of science. With the modesty of true genius, Mr. Pullan disclaims the merit of originality, and frankly confesses that without the assistance of Pliny's description, imperfect though that description is, the *certainly* which belongs to his restoration would be unattainable. All this may be conceded; yet we maintain that if the discovery of America—despite the previous voyages of the Welsh Prince Madoc and the Scandinavian Sea Rovers—be due to Columbus, the restoration of the matchless monument which Queen Artemisia built to her husband is due to the architectural science of Mr. Pullan and the historical and antiquarian attainments of Mr. Newton.

Before proceeding to indicate the principle and process of this memorable triumph of combined classical scholarship and architectural science, a word must be said about the plates, ninety-seven in number, in folio, which form to a large extent the subject of the text. In merit they are all that we should expect from the press of Messrs. Day and Son. Lithography here has imitated photography in the most successful manner, and will be more enduring; for we regret to say, that in several works which have been illustrated by photographs direct from the hands of the photographic manipulator, these already, although carefully excluded from the light, begin to fade. The principal draughtsmen are Lieut. R. M. Smith, of the Royal Engineers, and Mr. Pullan, who accompanied the expedition as architect. The photographs, made by Corporals B. Spackman and M'Cartney, R.E., have been cleverly transferred to stone by Mr. Pickens. To most persons these will have the greatest interest, as they show the state of the excavations at different points, and a number of local details which

* *A History of Discoveries at Halicarnassus, Onidus, and Branchida.* By C. T. Newton, assisted by R. P. Pullan. London: 1862.

no mere description in letter-press could realize to the mind. The topographical maps, the architectural plans, the details of form and ornamentation, are all laid down on such an extensive scale, that the descriptions of the monuments of Budrum, Cnidus, and Branchidæ, given by Mr. Newton and by Mr. Pullan, can be followed without the slightest difficulty.

What we have found the most interesting portion of the plates, is that devoted to the restoration of the Tomb of Mausolus, from Mr. Pullan's drawings. As we have observed, the restoration is a most ingenious example of architectural synthesis, conducted to a convincing demonstration. Of this "wonder of the world," for several centuries the site was unknown, and when discovered through the perseverance and sagacity of Mr. Newton, not one stone was left standing upon another, except out of place. The materials of the tomb were appropriated ages ago to build the Castle of St. Peter, at Budrum, to supply the wants of private builders for walls, or to furnish lime; and all that the labour of excavation brought to light was about twenty varieties of architectural stones, "in most cases so much damaged by exposure to weather, or defaced by having been used in the adjoining walls and houses, as not to afford that degree of exactitude necessary for a perfect restoration of the edifice." It was, however, from these twenty varieties of architectural stones, and Pliny's description of the tomb, that the problem of the restoration had to be worked out. Without the latter, any number of stones would have been insufficient. Pliny's measurements, indeed, are sufficiently puzzling, but yet afford a tolerably intelligible groundwork for the ingenious architect, with the fragments of the tomb at his command, to proceed upon. But Mr. Pullan, in his restoration, does not build from the foundations upwards, but from the highest point of the monument downwards, and for a good reason. Pliny describes the monument as being 140 feet high. He assigns 75 feet for the height of the pteron, or peristyle edifice, and pyramid with its quadriga, and thus leaves 65 feet unaccounted for, which Mr. Pullan is warranted in assuming must have been the height of the *podium* or basement. The figure of the monument was a quadrilateral, the east and west sides being the shorter; the entire circumference was 411 feet or 440 feet, there being two statements.

First had to be determined, from existing remains, the height of the tomb. From a fragment of the nave of the chariot wheel and its periphery, belonging to the quadriga, Mr. Pullan determined its diameter to be 7 feet, and with the figure of Mausolus standing above the axle, he assumes the height of 13' 3½" for the chariot group. This group stood upon a pyramid of twenty-four steps, and from measurements of the *rise* of the existing stones, he arrives at 24' 6" for the height of the pyramid resting on the pteron. This result agrees nearly with Pliny's statement, that the height of the monument above the thirty-six columns on which it stood was 25 cubits (37½ feet). The measurement of stones belonging to the entablature, and of the drums of columns and of capitals belonging to the pteron, gave from the base of the columns to the cornice under the pyramid, 37' 2½", which, added to the height of the pyramid and the quadriga, gives exactly Pliny's measurement of 75 feet. The remaining 65 feet belong to the podium, and thus the whole height of 140 feet is satisfactorily made out.

Next for the length and breadth of the tomb. Here, again, the pyramid was the key to the whole. From the wheel and fragments of the horses of the quadriga, it was determined that it stood on a pedestal on the top of the pyramid 25' 6" by 20' 5". Then, from the breadth of the *trads* of the pyramid, it was determined that its base measured 106' 5" by 85' 5". The length and breadth of the basement were, of course, greater than the length and breadth of the base of the pyramid, and these were determined upon the principles of architectural science.

The length of the podium or basement was 119 feet on the south and north sides, and the breadth 88' 6" on the east and west ends. Adding these dimensions together, and multiplying by two, we have 415 feet. Pliny gives 411 feet, or 440 feet, the difference arising from an obscurity in the text. At all events, Mr. Pullan's approximation is remarkable. Without the aid of plates it would not be easy to show how these results have been arrived at; but a perusal of the work will amply reward the student of architecture, and convince him, we believe, that the results have been fairly and scientifically wrought out.

The remainder of the volume of plates is occupied with the antiquities of Cnidus and Branchidæ, and with inscriptions found at Hali-

carnassus (Budrum). The views of excavations, the topographical plans, the representation of statuary, &c., are all in the best style of lithography. Upon these, however, we cannot enter until the appearance of another volume of Mr. Newton's text. Altogether, the present must be regarded as a national work, creditable to all the parties engaged upon it. Its great price, however, will place it beyond the reach of the ordinary book purchaser; but an enterprising publisher might issue an edition which would satisfy every craving for a more intimate knowledge of these magnificent remains of an age greatly advanced in art, if backward in some other excellences characteristic of modern civilization.

WHAT SHALL PRINCE ALBERT'S MONUMENT SAY?*

THE author of a small pamphlet, whose title is given below, wants to impress upon the Committee to whom the erection of a suitable Memorial to the late Prince Consort is confided, that it is a fitting occasion at least to make some effort to improve our national monuments. In this most people will agree with him. But whether the Committee would be justified in adopting his suggestion is a matter upon which opinion may very possibly be divided. He says:—

To me it appears that no imitation should be admitted. Egyptian, Assyrian, Greek, Roman, Italian, Mediæval, Gothic, should all be entirely avoided, and something adapted which shall embody and reflect the life, feeling, and thoughts of the nation. We would repudiate all heathen symbols—sphinxes, winged globes, reversed torches, funeral cypresses, urns, and insignia of the undertaker—all allegorical figures and allusions. Hope with her anchor, Fame and trumpets, Victory and laurel wreaths, Britannia and Lions—all these have been repeated to exhaustion.

The characteristics of English modes of thinking, feeling, and taste, are simplicity, truth, meaning, purity. Our life is earnest, domestic, practical; our habits plain and simple; our actions devoid of all extravagance. Our most deep or vivid emotions are betrayed by no gesticulation or histrionic attitudes. We are unaddicted to pomp, pageantry, or finery. Magnitude, apart from utility, excites no admiration; greatness is never identified with mere vastness of size; hence the gigantic statues which occupy our public places move no feeling of awe, no sentiment of admiration.

The ideal of a monumental memorial of a Prince who achieved no military glory, who effected nothing great in political affairs, who did nothing which can be presented in a mechanical form, but who has impressed upon our fond memories that which is immeasurably better, is that it should be appropriate, unique, and calculated to excite the same feelings as would arise in his living presence.

In conformity with these sentiments, the proposed obelisk should be associated with sculptures simply and truthfully representing the Man whose memory we desire to honour. These sculptures should speak to the eye and heart of every Englishman in language he can understand, refer to feelings and sentiments with which he can sympathize, furnish lessons which will impress themselves on his memory, and excite a beneficent influence on his conduct. They should be framed on principles now vital and active, neither brought from the past, nor anticipate an imaginary and unknown future.

What, then, should they be?

1st. The Prince, with the Queen and all his family—every figure of the exact size of life—portraits as accurate as possible, grouped so as to produce at once the most life-like and picturesque effect.

It was here, amid his family, that the virtues of the departed Prince shone most conspicuously. It was for his devotion to his royal wife and children that we most esteem him. It was his admirable conduct as a husband and father that won the nation's love. Can a more appropriate tablet be devised to perpetuate his memory, than to place his image among those of all his loved ones, as they were in age, and form, and feature, at the period just preceding his departure from them—to fix the scene, and tell the tale of his domestic life to the present and succeeding generations?

In an artistic point of view no subject could be imagined more susceptible of embodying high talents, beauty of form, tenderness and purity of feeling, skill in composition and execution, than such a family group.

Sir Charles Eastlake, perhaps beyond any living artist, could make this subject so beautiful, so truthful, so expressive of everything that is dignified and touching, so full of meaning and feeling, that no one could look upon it without emotion.

In reference to the inscription which the monument should bear, "Omega" says:—

I would suggest that, as no limit can be assigned to the character of the monument about to be erected, so it should be regarded as possible that it may survive our literature—our language—our history. This brings us to the inscription; for this, on the above plan, eight panels are provided.

I would have a simple, truthful, full narrative of the Prince's life, written with a sparing use of titles and epithets—such a life as his own refined taste would have approved, prepared with as much care as the sculptures. It may be brief in extent, though full, as comprehending every important fact.

This narrative should be engraved on the stone faces, in four languages—for the middle gradient, English, German, French, and Hindustani. Why this latter? it may be asked; is not this fantastical? It is the language spoken by a numerical majority of the Queen's subjects—that is my reason for selecting it. If this is thought insufficient, let another be chosen; but this, by employing a smaller character, might be in two forms, Hindi and Ordo, in the Persian and Nagree alphabets.

On the four faces of the upper gradient I would repeat the narrative in the four languages of the great literatures of the past—Hebrew, Sanskrit, Greek, and Latin. The reasons have been already stated—the Memorial is for an incalculable future.

* Letter to the Right Hon. the Earl of Derby on the proposed Memorial to the Prince Consort. By Omega. London: Darton and Hodge.

* Decimal scales have been adopted, as affording the greatest exactness; but where dimensions are quoted in the description of the building, feet and inches are usually given, for the purpose of conveying a clearer idea to the reader. Thus 18' means 18 feet divided into 10 parts or inches, while 3½" means 3½ of the same inches.

We have made greater use of this pamphlet than we should otherwise have done, since the author's modesty caused him to print so few that scarcely one in a thousand of our readers are ever likely to see it; and in addition to this, his remarks appear to us to be worthy of the consideration of all who are interested in improving the character of our public buildings.

THOUGHTS, PRACTICAL AND PHILOSOPHIC.

DECLINE OF BUILDING SKILL.—Where are now the bricklayers who could build walls which, for neat and strong work, are in these days still a delight to look at? the stonemasons who could select stone which, fifty years after the completion of the edifice, exhibits in many cases as clean work as the day it was done, and which will endure for years without either the process of a triennial cleaning down, or with covering over with five or six coats of paint? the carpenters with their joists, roof, and flooring adapted to all requirements without the additions of ironwork, to render small scantlings efficient for the duty of proper ones? the carvers of all kinds yet putting to shame our modern make-believe attempts at composition and papier maché? the plasterers with their ornamental work, executed by hand on the wall or ceiling itself, rendering the modern "decorator" a person of no consequence? These were all art-workmen, and truly so; and we shall not have them again until the building trade, leaving the control of one man, who undertakes all trades "by contract," shall again be carried out by the master workman with his assistants, as formerly practised. It is thus only that the best work is performed even in the present day in England, and by all trades in foreign countries.—*The Builder*.

THE ARTIST.

He is a being of deep reflection—one
That studies Nature with intensest eye:
Watching the works of air, earth, sea, and sun:
Their motion, altitude, their form, their dye—
Cause and effect; the elements which run
Or stagnant are, he traces to their source
With vivid study, till his pencil makes
A perfect likeness: or by fancy's force
A new creation in his heart he takes,
And watches Nature's progress in his course
Towards glory. In the abstractions of his mind,
Harmony, passion, and identity,
His genius like the summer sun is shrined
Till beauty and perfection he can see.

HONE.

He rends the oak and bids it ride
To guard the shores its beauty graced;
He smites the rock upheaved in pride,
See towers of strength and domes of taste;
Earth's teeming caves their wealth reveal,
Fire bears his banner on the wave.
He bids the mortal poison heal,
And the destroying knife to save;
He plucks the pearls that stud the deep,
Admiring Beauty's lap to fill;
He breaks the stubborn marble's sleep,
Rocks disappear before his skill;
With thoughts that swell his glowing soul,
He bids the ore illumine the page,
And proudly scorning Time's control,
Commerces with an unborn age.

In fields of air he writes his name,
And treads the chambers of the sky;
He reads the stars, and grasps the flame
That quivers in the realms on high.
In war renowned, in peace sublime,
He moves in greatness and in grace;
His power subduing space and time,
Links realm to realm and race to race.

SPRAGUE.

SPIRIT AND MATTER.

Hast thou ever thought, oh! mortal man,
That the sun itself is a thought began?
And that thoughts are the inner suns that dwell
Inspired as minds in each burning shell?

Hast thou ever thought how the light forth came?
I'll tell thee:

God breathed, and a sphere of flame
Outrolled and enwrapped the universe.
Each ray of light was a thought in verse,
From the poet heart of our God outsung.
Didst thou ever think of the human tongue,
How still in itself, yet in speaking the air
Into music of wisdom melodious and rare?
Look at it—think of it—thy tongue can tell
Great truths, yet itself, like the tongue of a bell,
It thinketh not, and it hath no voice,
Yet its golden tones bid the world rejoice.

All matter is God's tongue!
Out from its motion God's thoughts are sung;
And the realms of space are the octave bars,
And the music notes are the suns and stars.

REV. T. L. HARRISS.

VITRUVIUS enumerates twelve qualities requisite to constitute a good architect: that he be docile and ingenious; well educated; skilled in designing, in geometry, optics, arithmetic, history, philosophy, music, medicine, law, and astronomy.

ORNAMENTAL ART.—It is an incarnation of fancy, and is a sort of petrified poetry, or concrete rhetoric. It is the blossom of the Art-tree, whose root is thought, and whose trunk is imagination. It is inventive, imitational, and composite. Egyptian ornament is thoughtful and always allegorical. The Assyrian is still quieter, simpler, and more primitive. The Greek revels in noble sweeping curves and fretted foliage, highly conventionalized. The Oriental types, in their art, lost their symbolic character, and became enriched and idealized by fancy, harmony, and a sweet grace in every line. The Etruscan is rude and Asiatic, with Greek luxuriance. The Roman is strong and vigorous, leafy, luxurious, and voluptuous. The Byzantine is barbarism, rich, knotted, linked, and studded like embroidery. The Moorish is the poetry of geometry and the mathematics of colour, varied and changeable as Nature. The Gothic is Nature subdued and limited by rules and space. The Indian is varied, strange in its blendings and studied intermixtures, arranged by the instincts of men in a hot climate; but the Persian is the most graceful and poetical of all Oriental work; gorgeous and yet delicate in colour, it is full of the broadest effects of contrasting hues, and wreathed and blossomed with threads of flowers bright as those of a missal. In the harmonies of dyes there are invention and imagination. Let our student follow Nature boldly and lovingly, but not servilely—learning to compose as she does, not following her laws without laying down his own. Above all, let him remember that ornamentation is to art what words are to thought, and that if design and architecture are dead, no ornamentation, however beautiful, can give them life. It will be but at the best a wreath of flowers round the pale brow of a corpse.—*Athenæum*.

THE FUTURE.

The solemn temples that share duration
With man himself in his generation,
Shall rise unfolded in sculptures fair,
Like epic hymns through the fragrant air;

And the kingly glories of time and space,
And the lovely hues of the human face;
And the solemn swells of the human heart,
Fired with the presence and theme of art;

And the wondrous charms of song divine,
And the rapt musician's heaven-taught line:
And the tinted beauties and statues grand
From the painter's eye and the sculptor's hand;

And the high revealments of sages wise,
And the vision vast of the prophet's eyes;
And the boundless joy that is everywhere,
In the stars, and the suns, and the fields of air;

And the breathing beauties of field and flood,
Outspring from the Mind of the Perfect Good;
And they blend and shine in the perfect whole,
And live from the One Creative Soul.

REV. T. L. HARRISS.

PATENTS CONNECTED WITH BUILDING.

WINDOW-SASHES.—D. Miles, Newport, Monmouthshire. Dated 7th August, 1861.—The patentee claims the combination of parts tied or kept together by metallic tongues; forming, when complete, a rigid and secure window-sash; and permitting, on the withdrawal of the said metallic tongues, both the upper and lower sashes partially to revolve, in order that either side of the glass may be cleaned from the interior of the room or chamber at pleasure; also the combination of parts in using which he dispenses partly with the metallic tongues for the lower sash, or both upper and lower sashes, and uses a spring catch, or two spring catches, in lieu thereof; also the combination of parts by which he causes both upper and lower sashes to present, singly or together, either face of the glass to the interior of the chamber, substituting the use of spring catches in lieu of metallic tongues.

COVERING FOR HOUSES, &c.—N. A. Leussour, Paris. Dated 7th August, 1861.—This invention consists, principally, in giving to bricks, tiles, &c., by means of grooves, notches, or mortices cut in dovetail, the faculty of being set and fixed rapidly, solidly, and economically.

THE CONSTRUCTION OF DOORS, GATES, AND SHUTTERS, PRINCIPALLY APPLICABLE TO FIREPROOF BUILDINGS.—W. S. Hogg, Rotherhithe, London. Dated 8th August, 1861.—This invention consists in forming the above-mentioned articles of parallel iron or other metal bars, rebated or grooved to receive bricks or other moulded forms of earthen materials. In many cases ordinary bricks will answer the purpose, and may be variously disposed according to the structure required. The parallel iron bars are combined with an external iron framing of the form and size desired.

PRESERVATION OF STONE AND OTHER ANALOGOUS ABSORBENT SUBSTANCES.—F. S. Barff, Dublin. Dated 9th July, 1861.—This invention consists in employing for the said purposes solutions of the alkaline silicates, combined with the aluminate of potash, or other suitable reagent, in such proportions as to allow sufficient time to elapse for manipulating the said solutions, and thus enabling it, when applied to the surface of the stone, or otherwise, to enter into and effectually penetrate the same. The said solutions, in combination with powdered pumice-stone, or other like material, are also employed for producing or manufacturing artificial stone for attrition, building, or other purposes.

GLAZING HORTICULTURAL BUILDINGS, THE ROOFS OF RAILWAY STATIONS, &c.—T. G. Messenger, Loughborough. Dated 6th September, 1861.—This invention consists in laying glass in such wise that each edge of the glass (which glass may be of any required shape or size) shall lie on one side of an open gutter, which said gutter may form a gutter only, or it may form a gutter and rafter, either cast or rolled in one or two parts; the said gutter is made to carry off all the condensed vapours from the interior, as well as the rain, &c.

BRICKS.—R. O. White, Blackheath Park. Dated 7th September, 1861.—This invention is applicable when burning bricks in open clamps or kilns, where fire is mixed with the brick earth, and is also interposed between some of the courses. For these purposes, in order that the bricks may be more uniformly burned, and come out of an open kiln or clamp of uniform quality, the system of setting the bricks in "necks," heretofore practised, is got rid of; and the bricks are set in one direction, in such manner that each course of bricks breaks course with the course above and below.

APPARATUS FOR MAKING BRICKS, TILES, DRAIN-PIPES, &c.—P. Effertz, Manchester. Dated 5th September, 1861.—This machine is intended for producing perforated, solid, and paving bricks, gutter-tiles, roofing-tiles, cornice-tiles, pantiles, drain-pipes, and other similar articles. The clay is fed into the machine through a hopper, mixed by a combination of screws through a grate to be cleansed from stones and other objectionable matters, modelled or moulded by pressure to the desired shape, and received as an endless band by a rolling table in front of the machine. This rolling table is provided with a self-acting cutter, put in motion by the band of clay emerging from the machine, and cutting the said band into any length desired at right angles to the surface, or at an angle proportionate to the velocity. The necessary pressure is exerted through a combination of screws requiring less power than any other now in use. The machine consists of two main parts or divisions. Firstly, the press for mixing, cleansing, and shaping the clay. Secondly, the self-acting cutting-table on which the band of clay emerging from the mould is cut. The invention cannot be described without reference to the drawings.

GENERAL INTELLIGENCE.

THE LATE MR. JAMES ELMES, ARCHITECT.—We have to record the death of Mr. James Elmes, formerly surveyor to the port of London, which took place on the 2nd instant, after a lingering decay, although unattended with great bodily suffering. Mr. Elmes, who is perhaps best known by his work on "Dilapidations," and as the father of the architect of Liverpool Town Hall, studied architecture under Mr. George Gibson. He gained the silver medal in architecture at the Royal Academy in 1804, and afterwards designed and carried out some buildings in London and the neighbouring counties, and in Ireland. He relinquished his principal office, and that of vice-president of a society "for the diffusion of the knowledge of the fine arts among the people," in 1828, through loss of sight, which, however, he partially recovered a few years since. Mr. Elmes is the author of a memoir of the "Life and Works of Sir Christopher Wren," published in 1823; a volume on "Sir Christopher Wren: his Life and Times;" a volume of "Lectures on Architecture;" a "General and Bibliographical Dictionary of the Fine Arts;" "Elmes's Quarterly Review;" "The Annals of the Fine Arts;" "Thomas Clarkson: a Monograph," and other works. His remains were interred at Charlton, on the 5th instant.—*Builder*.

THE ALBERT MEMORIALS.—*Bristol*: At a meeting of the committee held at the Council-house, under the presidency of the Mayor, the precise form which the memorial should take was discussed; and it was resolved that it should be a statue, and that, should a sufficient amount be obtained, there should be an addition of water, in such shape as would present a statue and fountain in harmonious combination. The subscriptions then amounted to 370*l*.; and confident hopes were expressed that the amount required would be obtained.—*Hanley*: Upwards of 500*l*. have already been contributed towards the cost of converting the Hanley School of Art into a memorial of the late Prince Consort, by the purchase of the premises and their adaptation to an extended scheme of usefulness.—*Liverpool*: Mr. Thornycroft has been selected by the committee of the corporation of Liverpool to execute the equestrian statue of the Prince to be erected there.—*Wakefield*: At a meeting held at Wakefield, under the presidency of the Mayor, it has been resolved to erect some memorial of the Prince in that town. The form of the testimonial was left for further consideration, but the enlargement of the Clayton Hospital was suggested.—*The Scottish National Memorial*: At a recent meeting of the local committee for the city of Edinburgh, it was announced that the subscriptions reported to the conjoined committees for the city, and the county of Midlothian, exceeded 3370*l*. This was exclusive of the subscriptions at Leith, Musselburgh, and Portobello, which were under the charge of separate committees; and also exclusive of sums collected by the numerous local committees in different parts of Scotland. Arrangements, according to the *Scotsman*, are in progress for affording an opportunity to artisans and domestic servants to subscribe sums of whatever amount they may find convenient.

THE BRITISH MUSEUM.—The decision of the Government on the subject of providing additional accommodation for the collections of the British Museum is now definitely announced, by the publication of the correspondence which has passed between the Lords of the Treasury and the Trustees. The structural alterations which are proposed to be effected, are, of course, subject to such modifications as may hereafter be determined. They are mainly comprised in the following suggestions. Right and left within the readers' entrance of the corridor leading to the reading-room are to be new staircases. The present staircase on the left of the entrance-hall is to be removed. With the area thus gained, and by taking down the wall which divides the staircase from the Roman Gallery and substituting columns, a room, 94 feet by 60 feet, will be obtained for antiquities. The removal of sundry partition walls, and the appropriation of pieces of unoccupied ground to the west, will allow additions to be made to the Egyptian Gallery, the Græco-Roman Saloon, and the Elgin rooms. On the upper floor, the rooms now occupied by Geology, Mineralogy, and Palæontology will be transferred to the antiquities, which already occupy the west side. Such is the solidity of the building that all the galleries on this floor might be used for the exhibition of sculptures, even of large size. When the new library and reading-room were erected, it was believed that there would be space for 800,000 volumes, calculating the annual increase for forty years at 20,000. But the annual increase has now reached 35,000 volumes: and, although the new building will contain more books than it was originally estimated to hold, yet, if the present rate of increase continue, it will

be full in about twenty-five years. Alterations are indicated which would provide additional space for 200,000 volumes. Details are given of the proposed accommodation for the binder, for the Trustees' offices, and for the several collections of prints and coins. Into these it is needless to enter more particularly. The proposed additions to the departments retained in the Museum are shown in the following list:—

	Present space.	Proposed addition.
Printed books, square feet . . .	117,746	— 17,803
Manuscripts	13,178	— 3,430
Antiquities	91,784	— 67,692
Coins and Medals	2,950	— 4,950
Prints and Drawings	2,600	— 5,554
Offices, &c.	6,724	— 3,626
Binders	4,539	— 3,221

The Committee urge that the erection of buildings on unoccupied ground at the Museum should be proceeded with at once, and also that no time should be lost in providing buildings for the reception of the Natural History Collections; because, until this be done, no redistribution of the vacated space can possibly be undertaken. The Chancellor of the Exchequer has announced his intention of introducing a Bill into Parliament for the purpose of legalising the separation of the collections at the British Museum on the plan proposed, and for maintaining the control of the Trustees over the several collections. The site designated by the Royal Commission is understood to be that temporarily occupied by the western annexe to the International Exhibition, and forming the east side of Prince Albert's-road. As the Government wish to have eight acres of land, a portion of about two acres, with a frontage to Kensington-road, will probably be added in order to obtain the required extent.

PARIS.—A few steps from the Boulevard de Sebastopol (*Rive droite*) a house is being constructed which will cause the disappearance of the last vestiges of one of the most ancient thoroughfares of this old quarter—that of the Rue de la Vieille Monnaie. This street, whose origin *se perd dans les nuits du Moyen age*, was known, before the time of St. Louis, by the name of Rue de la Monnaie. A little higher up, on the Boulevard de Sebastopol, at the angle of the Rue Rambuteau, there remains also the last house of another old street; there commenced the Rue Salle-au-Comte. The Comte de Daumartin lived there, his hotel having been, some time afterwards, the abode of the Chancellor de Marie, who was massacred in 1418 by the Bourguignons when Paris was given up to the populace by Perinet Leclercq. The belfry erected between the Mairie of the first arrondissement and the church of Saint Germain l'Auxerrois is completed, with the exception of the placing of the clock. The open space extending in front of this façade of the Louvre is completed, but not after the original design of Perrault, who proposed thereby to open an immense square between the colonnade and the Pont-Neuf; so that the demolition of the church of Saint Germain l'Auxerrois and the adjoining block of houses would have followed. In order to disengage the side of the Louvre in the direction of the river, Louis XIV. proposed the erection of a monumental bridge opposite the Leasguières pavilion. The bridge was to have terminated at the other side of the Seine, in a semicircular open space, whence three boulevards were to radiate—viz., one to the south-west, towards the esplanade of the Invalides; another to the south-east to the Luxembourg; and a third straight to the south, joining into the road to Versailles. The works of the Billancourt bridge, commenced in the month of September last, have been suspended, owing to the flood of water in the river. The structure is to be composed of two sections, united by an island—viz., three arches over the large branch of the Seine, and two over the others; in all five arches. The Billancourt bridge will afford ample means of communication with Boulogne and other suburbs on the right bank of the Seine, where the population is continually increasing, and desirous of communication with the communes of Issy and Bas-Meudon, so rich in materials of construction of all sorts. Above Billancourt the Seine is to be crossed by another bridge, a girder one, to carry the *chemin de fer de ceinture*, and for foot passengers. The execution has been ordered, and all steps taken for its construction.

INGENIOUS MODEL.—A man named Anderton, a labourer, residing at Bracebridge, has for many years been engaged on a model of Lincoln Cathedral in cork, which he intended obtaining space for in the Great Exhibition of 1862. The model is now complete, and is said to be an exact counterpart of the original. Upwards of a million of old corks have been used in the construction, each of which has been cut into a proper form with the aid of a knife alone. The length of the model

is 10 feet 5 inches, width 7 feet 6 inches, and height 5 feet 9 inches. All the minutiae of the original are faithfully copied; the figures on the west front and in the south-eastern entrance being, it is said, exceedingly well done. The interior has also been copied as faithfully as the exterior, even to the organ and the stained-glass windows.

THE SINGULAR DISCOVERIES IN THE SWISS LAKES.—Recent discoveries show that at some primeval period a population of very considerable density lived in huts constructed on stages which rested on wooden supports driven into the bed of almost every Swiss lake, just as the Malays in Borneo and the Siamese in Bangkok may be seen living to this day. A wonderful number of articles pertaining to the daily life of those forgotten races have been brought to light. In some places the materials of the dwellings have been preserved in the mud,—the floor of hardened earth and the twisted branches and bark which formed the walls. Arms have been discovered in great quantities, tools, from swords in flint to needles in bone, ornaments, children's toys, the remains of stored-up fruits of various kinds, nay, even a cellar or receptacle full of corn, and a loaf of bread composed of bruised grain, and preserved by carbonization. By the side of these relics are found the bones of the animals which they slew in the chase, many belonging to species extinct before the rise of history, or barely mentioned in it. The urus, the bison, the elk, and the beaver furnished them with food and with the materials for some of their most ingeniously-constructed utensils. So plentiful and perfect are the remains found in the lakes, that much more has been learned concerning the daily life and manners of men whose existence was not suspected ten years ago, than is known of races which have left a famous name in history or tradition.

FALL OF TOWERS AND SPIRES.—Winchester Cathedral: Tower fell in 1107. Ely Cathedral: Central tower fell suddenly, in 1321 or '41. Gloucester Cathedral: Tower fell suddenly in 1160. Worcester Cathedral: Tower fell in 1175; two towers fell in 1222. Lincoln Cathedral: Tower fell in 1240. Norwich Cathedral: Spire and tower fell in 1361, destroying the choir. Hereford Cathedral: Western towers and front fell within the last century. Wells Cathedral: Prevented from falling in 1321, by inverts and buttresses, "in gross violation of all taste and architectural propriety." (See Dr. Willis's paper.) Chichester Cathedral: Tower and spire fell in 1861. Dunstable Priory Church: Two towers fell in 1221. Evesham Priory Church: One tower fell in 1213. Canterbury Cathedral: Tower saved from destruction, in Dr. Willis's opinion, by means similar to those at Wells. Salisbury Cathedral: The spire 23 inches out of the perpendicular; its fall predicted in the *Builder*, April, 1861. St. Nicholas, Hereford; St. Mary's, Redcliffe, Bristol: Both with truncated spires, owing either to their upper part having fallen, or to their being left incomplete in apprehension of a fall.

MR. R. W. JONES, of Cork, has obtained a patent, dated 26th August, 1861, for heating and ventilating, especially applicable to Turkish baths. All who have used those baths must have felt that something was required to render them agreeable as well as useful.

NOTICE TO CORRESPONDENTS.

In the execution of the Plates which form our Illustrations, we hope always to have the advantage of the drawings of the Architects whose buildings we represent. We also invite those gentlemen, in every instance, to communicate both with our artists and ourselves during the progress of our engravings, and we shall always be anxious to secure their approval for every illustration on its completion.

The lithographs contained in the present Part have all been executed from the original drawings of the Architect, and also from his working drawings, with the additional aid of photography; and they will doubtless be preserved and valued as faithful pictures of the Great International Exhibition, as it appeared on May 1st, 1862.

All communications for the Editor to be addressed to the care of DARTON AND HODGE, Publishers, Holborn-hill, E.C.

RUSKIN AND HIS TEACHINGS.



NE of the signs by which a really great man* may be known, is that he invariably succeeds in making people uncomfortable. True, a very small man may, and frequently does, the same thing. But not necessarily. In general, the small man lives a quiet, commonplace, inoffensive life. He respects the prevailing taste; complies with all respectable conventions; defers to every fashionable custom; pays his rates and taxes without asking any questions as to how they are spent, or for what purpose they are levied. His "gig"—the true symbol and certain sign of his respectability—is beautifully varnished, its joints and springs are well oiled, and it is never driven out of the smooth and even ruts of recognised routinity. From all this it is manifest that he is on the sure road to rising in the world—by becoming a vestryman, a town councillor, or—highest flight of mean or mediocre ambition—a Member of Parliament.

The great man generally fails in all this—even if he should attempt to succeed in it. It is seldom, however, that he does make the attempt. As a rule, he is at war with some custom or other because he believes that custom to be at war with truth, with nature, and with human wellbeing. His great mission is to put an end to the putrifying intellectual stagnation—to the deadening sameness of thought and slavish uniformity of mental action and expression to which, under the moral tyranny of fashion, human beings are so fearfully and so fatally inclined. He stirs the still waters of the popular mind, because he knows that without this disturbance no healing virtue can come out of them. But this disturbance is certain to destroy the comfort of the numerous creeping things that are sheltered beneath the green corruption that mantles the surface of the pool, and to whom stagnation and putrescence are essential elements of existence. It therefore necessarily happens that with all those who have, or imagine they have, vested interests in established rottenness, the teacher, the reformer, the purifier, is a very unpopular personage. It could not well be otherwise. Mankind, in the mass, are lazy, and, in the absence of some goading or impellent influence, irresistibly prone to inertia. The toil and the travail which are indispensable to the attainment and maintenance of true and incessant intercommunion with nature and with nature's God, are exceedingly distasteful to the great majority of human beings. If they could only live without work, most certainly no work would be done by them. Their activity, which seldom aims at anything higher than animal gratification, results from the same cause which precipitated the Tartar or Hunnic hordes of Attila upon the Roman Empire—the impossibility of finding the means of sustenance on their native steppes and wildernesses.

But, co-existent with this love of rest, there is the love

of knowledge. Now, the indulgence of the one is incompatible with the indulgence of the other. Knowledge cannot be gained without labour, and man, that is, the better part of him, cannot live without knowledge. Here, then, is the problem which, from the beginning of the world—or at least from the eating of the forbidden fruit—mankind have been trying to solve—namely, how to live without work. The solution has not, up to this present moment of writing, been effected, for even the professed plunderers of society have to labour for their living. The mere destructives have to work with both hands and heart, in order to live upon those that do the productive work of the world. One of the consequences of this condition of things has been a compromise. Mankind have agreed to labour as little as they possibly could, even though the result should be a very inferior and shabby style of living. Hence the extreme readiness with which superficial, plausible, and easily comprehended creeds and theories of the universe and its multiplex forms and forces are adopted; and hence, too, the fierce and desperate tenacity with which mankind cling to every creed, theory, or system that has once effected a lodgment in their understandings.

Thus it has happened that in every age and country the assailant of the established theory, whether it relate to religion, government, art, or philosophy, is regarded as a common enemy—as a general disturber of respectable people's repose—as a national or universal nuisance which ought to be abated. Moses pestering King Pharaoh and his nobles with the great question of Hebrew emancipation; Elijah troubling Israel with his scathing denunciation of Baal worship; Socrates ridiculing and discomfiting the Sophists of his day; Galileo shattering orthodox systems of astronomy; Harvey exploding received theories of physiology; Howard preaching and crusading against the foul dragon of inhumanity which lurked and ravaged in the prisons of Christendom; or a George Stephenson revealing a new mode of locomotion,—each and all of these have been exposed to public hatred or scorn, and denounced as madmen, impostors, or idiots by the votaries of the things which these great men professed to supersede.

It was quite natural that it should be thus. Man is a proud as well as a lazy creature. He does not like to confess that he has been harbouring a lie all the days of his life. His self-love is enlisted on the side of errors. He will battle as stoutly in defence of the deadliest delusions as he will in defence of the most vital realities. What, then, is to be expected but that the teacher who tells him that his boasted learning is mere piled-up ignorance—that the gods of his devoutest idolatry are either malignant demons or impotent fetiches—that even his most adorable "golden calf," enshrined in his "holy of holies," is not gold, but a mere lacquered sham, a Brummagem imposture, a wooden or earthenware image, with just enough gilding to impose upon the superficial eye of a fool,—what, we say, can be expected but that the man who proclaims these wholesome but unpalatable truths should be regarded as a most disagreeable and

* By which of course is meant a great teacher, for every great man is, in virtue of an eternal law, a teacher of some great and necessary truth.

most dangerous person, whom it is the sacred duty of all loyal and respectable people to put down? The truth is, that human beings—unless compelled by the overpowering manifestation of the beauty of truth, and the ugliness of error—will submit to any degradation, become the slaves of every sin, and the perpetrators of every crime, sooner than become the docile and believing little children who alone can enter the heaven of beauty and of truth.

John Ruskin is a great and fearless teacher, not of art only, but also of morality, and even religion. As such he has waged fierce implacable war against some of the most powerful idolatries and delusions of the age. He has therefore experienced the fate of every other great teacher. He has been vilified and misrepresented; the envenomed shafts of satire, and the ponderous cannon-balls of invective, have been discharged at his head. Quarterly reviews, monthly magazines, weekly and daily journals, platform dissertations, and "learned societies," have done their utmost to hoot him down; and such is the remorseless vindictiveness of professional rancour and outraged bigotry, that, had the customs of the age but sanctioned it, physical restraint would have been resorted to for the purpose of silencing the voice and restraining the pen of this most eloquent and vehement of the modern teachers of truth in art and humanity in government.

The principles and purposes of Mr. Ruskin's teaching will be best learnt from his own works. These works, however, are for general readers too numerous and voluminous to be thoroughly studied. Messrs. Smith and Elder have therefore conferred a deep obligation on the whole public by the publication of a very elegant and portable book made up of "selections" from his various works. These "selections" are chosen with great intelligence, and they will serve not only as a "Handbook" to Mr. Ruskin's productions, but also as a guide to the artistic and ethical theories which he has so earnestly and eloquently expounded. From this welcome compilation, as well as from his separate and complete treatises, we now proceed to unfold the peculiar or characteristic views held and taught by Mr. Ruskin concerning architecture, painting, political economy, and other matters of human interest.

Mr. Ruskin's distinctive views on the two first are most clearly and decisively enunciated in his "Lectures on Architecture and Painting," delivered about nine years ago at Edinburgh, and published in a compact volume by Smith, Elder, and Co., of Cornhill. In these lectures he displays no small share of the art of the accomplished orator, combined with a large amount of the fire of the prophet. Having first humoured his audience by pointing out and praising the real excellences of Edinburgh architecture, he then in a most candid and emphatic manner proceeds to demonstrate and denounce its many manifest and manifold imperfections. "As far as I am acquainted with modern architecture," he says, "I am aware of no streets which, in simplicity and manliness of style, or general breadth and brightness of effect, are equal to those of Edinburgh." "But"—then there is such a terrible sameness about them. This sameness is the especial horror of Mr. Ruskin. To escape monotony and slavish mechanical

imitation, he is prepared to encounter, and if need be tolerate, the wildest irregularities and the most palpable and audacious transgressions of the laws of art. The reason for this is, that irregularity and transgression, if they be independent and spontaneous, are indicative of some sort of life, whereas monotonousness of style and imitativeness of formation are both the causes and the characteristics of complete spiritual death.

Mr. Ruskin institutes a parallel between the street architecture of the New Town of Edinburgh and the Old City of Verona, much to the disparagement of the former. He says to his Edinburgh friends, "Your decorations are just as monotonous as your simplicities. How many Corinthian and Doric columns do you think there are in your banks and post-offices, institutions, and I know not what else, one exactly like the other?—and yet you expect to be interested! Nay; but you will answer me again,—We see sunrises and sunsets, and violets and roses, over and over again, and we do not tire of *them*. What! did you ever see one sunrise like another? does not God vary His clouds for you every morning and every night? though, indeed, there is enough in the disappearing and appearing of the great orb above the rolling of the world, to interest all of us, one would think, for as many times as we shall see it; and yet the aspect of it is changed for us daily. You see violets and roses often, and are not tired of them. True! but you did not often see two roses alike, or if you did, you took care not to put them beside each other in the same nosegay, for fear your nosegay should be uninteresting; and yet you think you can put 150,000 square windows side by side in the same streets, and still be interested by them. Why, if I were to *say* the same thing over and over again for the single hour you are going to let me talk to you, would you listen to me? And yet you let your architects *do* the same thing over and over again for three centuries, and expected to be interested by their architecture; with a further disadvantage on the side of the building as compared with the speaker, that my wasted words would cost you little, but his wasted stones have cost you no small part of your incomes."

Mr. Ruskin's doctrines are remarkable, among other things, for the decisiveness with which they are enunciated. Though his diction is unsurpassed for its splendour, there is no writer more free from ambiguousness, hesitancy, or circumlocution. His magnificent rhetoric is but the handle of a most trenchant logic. Though the haft of his sword is blazing with brilliants, no one ever made less use of his weapon for the mere purpose of displaying it. Mr. Ruskin evidently believes that swords were made for use, not for ornament, and judging from the vigour and directness of his cuts and thrusts, there can be no doubt that in this matter at least his practice is in complete conformity with his creed. We give a few samples of Mr. Ruskin's decisive and aphoristic, if not dogmatic, method of instruction.

"All things that are worth doing in art are interesting and attractive when they are done."

"There is no law of right which consecrates dulness."

"The proof of a thing's being right, is that it has power over the heart, that it excites us, wins us, or helps us."

"Architecture is an art for all men to learn, because all are concerned with it; and it is so simple, that there is no excuse for not being acquainted with its primary rules, any more than for ignorance of grammar or of spelling, which are both of them far more difficult sciences. Far less trouble than is necessary to learn how to play chess, or whist, or goff tolerably—far less than a schoolboy takes to win the meanest prize of the passing year, would acquaint you with all the main principles of the construction of a Gothic cathedral, and I believe you would hardly find the study less amusing."

Mr. Ruskin is very clear and very brief in explaining the "principal distinctions between existing styles of architecture." Those distinctions, he says, depend on their methods of roofing any space—as a window or door, for instance, or a space between pillars: that is to say, that the character of Greek architecture, and of all that is derived from it, depends on its roofing a space with a single stone laid from side to side; the character of Roman architecture, and of all derived from it, depends on its roofing spaces with round arches; and the character of Gothic architecture depends on its roofing spaces with pointed arches or gables."

By Roman architecture he explains that he does not mean "that spurious condition of temple form which was nothing more than a luscious imitation of the Greek," but "that architecture in which the Roman spirit truly manifested itself, the magnificent vaultings of the aqueduct and the bath, and the colossal heaping of the rough stones in the arches of the amphitheatre—an architecture full of expression of gigantic power and strength of will, and from which are derived all our most impressive early buildings, called by various antiquaries Saxon, Norman, or Romanesque."

The main gist of his views on architecture as an art are reducible to six propositions.

1. That Gothic or Romanesque construction is nobler than Greek construction.
2. That ornamentation is the principal part of architecture.
3. That ornamentation should be visible.
4. That ornamentation should be natural.
5. That ornamentation should be thoughtful.
6. And that therefore Gothic ornamentation is nobler than Greek ornamentation, and Gothic architecture the only architecture which should now be built."

He contends "that a great architect must be a great sculptor or painter"—that "the three greatest architects hitherto known in the world were Phidias, Giotto, and Michael Angelo, with all of whom architecture was only their play, sculpture and painting their work;" that "all great works of architecture in existence are either the work of single sculptors or painters, or of societies of sculptors and painters, acting collectively for a series of years."

But probably the chief reason for Mr. Ruskin's pre-

ference for the Gothic is its effects upon the growth and character of the workman. The fashionable styles of architecture and decoration were characterized by such insipid sameness, such slavish repetition, that the mind and the hand of the workman have been reduced to a mere machine. "Reader, look around this English room of yours, about which you have been proud so often, because the work of it was so good and strong, and the ornaments of it so finished. Examine again all those accurate mouldings, and perfect polishings and unerring adjustments of the seasoned wood and tempered steel. Many a time have you exulted over them, and thought how great England was, because her slightest work was done so thoroughly. Alas! if read rightly, these perfectnesses are signs of slavery in our England, a thousand times more bitter and more degrading than that of the scourged African or helot Greek. Men may be beaten, chained, tormented, yoked like cattle, slaughtered like summer flies, and yet remain in one sense, and in the best sense, free. But to smother their souls within them, to blight and hew into rotten pollards the suckling branches of their human intelligence; to make the flesh and skin which, after the worm's work on it, is to see God, into leathern thongs to yoke machinery with—this is to be slave-masters indeed. And there might be more freedom in England though her feudal lords' lightest words were worth men's lives, and though the blood of the vexed husbandmen dropped in the furrows of her fields, than there is while the animation of her multitudes is sent like fuel to feed the factory smoke, and the strength of them is given daily to be wasted into the fineness of a web, or racked into the exactness of a line."

This mechanical slavery of the mind was altogether obviated by the liberty of invention accorded to each individual workman in the decoration of the Gothic structures. "Go forth and gaze upon the old cathedral fronts, where you have smiled so often at the fantastic ignorance of the old sculptors; examine once more those ugly goblins and formless monsters, and stern statues, anatomiless and rigid; but do not mock at them, for they are signs of the life and liberty of every workman who struck the stone—a freedom of thought and rank in scale of being, such as no laws, no charters, no charities can secure, but which must be the first aim of all Europe at this day to regain for her children."

For the overthrow of this mental slavery, and for the kindling of thought and inventiveness in the minds of our workmen, he lays down "three broad and simple rules."

"1. Never encourage the manufacture of any article, not absolutely necessary, in the production of which *invention* has no share.

"2. Never demand an exact finish for its *own sake*, but only for some practical and noble end.

"3. Never encourage imitation or copying of any kind, except for the sake of preserving record of great works."

Mr. Ruskin revels in the enjoyment of physical beauty. He believes, with St. Paul, that "the invisible things" of God "are clearly seen, being understood by the things that are made." His soul is wrapped in admiration of

the beauty and the majesty of the universe of God, except when it is aflame with indignation at the iniquities of man. He believes that to be beautiful is a duty second only to the duty of being good. "Man," he says, "*was* a beautiful creature, setting forth his beauty by all means in his power, and depending upon it for much of his authority over his fellows. So that the ruddy cheek of David, and the ivory skin of Atrides, and the towering presence of Saul, and the blue eyes of Cœur de Lion, were among the chief reasons why they should be kings; and it was one of the aims of all education, and of all dress, to make the presence of the human form stately and lovely. Now it has become the task of grave philosophy to depreciate or conceal this bodily beauty; and even by those who esteem it in their hearts, it is not made one of the great ends of education. Man has become upon the whole an ugly animal, and is not ashamed of his ugliness."

But "the beautiful alone is not for man. I believe that it is not good for man to live among what is most beautiful; that he is a creature incapable of satisfaction by anything upon earth, and that to allow him habitually to possess in any kind whatsoever, the utmost that earth can give, is the surest way to cast him into lassitude and discontent."

Mr. Ruskin's preferences in painting are based upon the same reason as his architectural predilections. Fidelity to truth or nature is the only claim to respect which he acknowledges. It is for this reason that he exalts Turner above all past and present painters of landscape. The five very large and handsome volumes which make up his "Modern Painters," were at first "intended to be a short pamphlet, reprobating the matter and style of shallow and false criticisms of the periodicals of the day on the works of Turner. But as point after point presented itself for demonstration, I found myself compelled to amplify what was at first a letter to the Editor of a Review into something very like a treatise on art, to which I was obliged to give the more consistency and completeness because it advocated opinions which, to the ordinary connoisseur, will sound heretical."

In this work, which not only is "very like," but actually *is* a treatise on art, and that, too, one of the most elaborate and eloquent, if not accurate, that ever has been written, Mr. Ruskin compares Turner with all the landscape painters, past and present, and assigns the palm of superiority to Turner. He places Turner in the same rank of intellectual greatness as Shakspeare and Bacon. "By Shakspeare, humanity was unsealed to us; by Verulam, the *principles* of nature; and by Turner, her *ASPECTS*. But of all three, Turner, though not the greatest, was the most unprecedented in his work. Bacon did what Aristotle had attempted; Shakspeare did perfectly what Æschylus did partially; but none before Turner had lifted 'the veil from the face of Nature.'" . . . "Turner was the first man who presented us with the type of perfect landscape art." As for "Claude, he embodies the foolish pastoralism, Salvator Rosa the ignorant terror, and Gaspar Poussin the dull and affected erudition, of the seventeenth century." Titian indulges in "exag-

gerated colour;" Tintoret is frequently magnificent, but sometimes, as in "the ground, foliage, and drapery, as well as in the lion of the lower angle of his St. Jerome, the larger features are executed with a slightness which admits not of close examination." Tintoret, however, as "the painter of space, stands altogether alone among dead masters, being the first who introduced the *slightness* and *confusion of touch*, which are expressive of the effects of luminous objects seen through large spaces of air, and the principles of aerial colour which have been since carried out in other fields by Turner."

In Rembrandt there are grandeur and dignity, and occasionally "sublime fidelity;" but "his system of *chiaroscuro* is inconsistent with the gladness, and his modes of feeling with the grace, of nature." Rubens "furnishes us with the first instances of complete unconventional, unaffected landscape. His treatment is healthy, manly, and rational; not very affectionate, yet often condescending to minute and multitudinous detail, always, as far as it goes, pure, forcible, and refreshing, consummate in composition, and marvellous in colour."

Coming to the English school of landscape painters, Mr. Ruskin says that Richard Wilson, if he had studied under favourable circumstances, possessed power enough to produce an original picture. But he was corrupted by his study of the Poussins; "still, he paints in a manly manner, and occasionally reaches exquisite tones of colour." Gainsborough is the "greatest colourist since Rubens," but the execution of his landscapes "is in some degree mannered, and always hasty, and they are altogether wanting in affectionate detail." Besides, "his colour is in some measure dependent on a bituminous brown and conventional green, which has more of science than of truth in it." Constable is thoroughly original, thoroughly honest, free from affectation, manly in manner, frequently successful in cool colour, and especially realizing certain motives of English scenery, with perhaps as much affection as such scenery, unless when regarded through media of feeling derived from higher sources, is calculated to inspire." But "there is a want of veneration in the way he approaches nature herself, and I have never seen any work of his in which there were any signs of his being able to draw, and hence even the most necessary details are painted by him inefficiently." On Calcott, Mr. Ruskin looks with less respect than on Constable. "There is no tendency in him with which we can sympathize, nor does there appear any sign of aspiration, effort, or enjoyment, in any one of his works." But, according to Mr. Ruskin, all that is wanting in the works of these and the rest of his predecessors, are to be found in the productions of Turner. "We may range over Europe, from shore to shore, and from every rock that we tread upon, every sky that passes over our heads, every local form of vegetation or of soil, we shall receive fresh illustration of his principles—fresh confirmation of his facts. We shall feel wherever we go that he has been there before us; whatever we see, that he has seen and seized before us; and we shall at last cease the investigation with a well-founded trust, that whatever we have been

able to account for, and what we still dislike in his works, has reason for it, and foundation like the rest; and that even when he has failed or erred, there is a beauty in the failure which none are able to equal, and a dignity in the error which none are able to reprove."

The cause of Turner's unrivalled greatness is, of course, in the first place, his God-given genius, and secondly, the fact that "he dwelt and communed with nature all the days of his life." Young painters are advised to follow his example. "Young painters should go to nature trustingly, rejecting nothing and selecting nothing; but they must be careful that it is nature to whom they go—nature in her liberty—not as servant-of-all-work in the hands of the agriculturist, nor stiffened into court-dress by the landscape gardener. It must be the pure wild volition and energy of the creation which they follow—not subdued to the furrow nor cicatrized to the pollard, not persuaded into proprieties nor pampered into diseases. Let them work by the torrent side, and in the forest shadows; not by purling brooks and under 'tonsile shades.'"

Mr. Ruskin's latest estimate of Turner corresponds with his earliest. The heart of the great painter, Mr. Ruskin also maintains, was worthy of his matchless genius. Towards the end of the fifth and final volume of "Modern Painters" he writes, "Turner had a heart as intensely kind, and as nobly true, as ever God gave to one of his creatures. I offer as yet no evidence in this matter. When I *do* give it,* it shall be sifted and clear. Only this one fact I now record joyfully and solemnly, that having known Turner for ten years, and that during the period of his life when the brightest qualities of his mind were in many respects diminished, and when he was suffering most from the evil speaking of the world, I never heard him say one depreciating word of living man or man's work; I never saw him look an unkind or blameful look; I never knew him let pass, without some sorrowful remonstrance, or endeavour at mitigation, a blameful word spoken by another. Of no man but Turner, whom I have ever known, could I say this. And of this *kindness* and *truth* came, I repeat, all his highest powers. And all his failure and error, deep and strange, came of his faithlessness. Faithlessness or despair, the despair which has been shown to be characteristic of this present century, and most sorrowfully manifested in its greatest men, but existing in an infinitely more fatal form in the lower and general mind, reacting upon those who ought to be its teachers."

As a political economist, Mr. Ruskin is no less eloquent and vehement than he is as an art teacher. Neither is he less misunderstood, nor less abused. The various attacks to which he has been exposed on account of his politico-economical teachings are all based upon a gross misconception of the character and tendency of his views. It is assumed by his critics and detractors that Mr. Ruskin is diametrically opposed to Adam Smith and all the lesser lights of the politico-economical school on the fundamental principles of their science. This is a mistake. The re-

lation of Mr. Ruskin to the political economists is one rather of *comprehension* than of *antagonism*. His political economy includes all, or almost all, that they maintain, and a great deal more. He believes as firmly as any of them, that by "buying in the cheapest market and selling in the dearest," by the working of the strength and skill of the labourer to the point of exhaustion, and the reduction of his wages to the point of starvation, capital may be made to yield a large interest, and large individual fortunes be speedily realized. But in addition to all this, he believes that buying in the cheapest market and selling in the dearest is not the chief end of man's existence; that a nation may be very rich, and at the same time very weak and contemptible; that riches may be a curse instead of a blessing; and that, in the estimation of God, the spiritual life and moral condition of the worker is of infinitely greater importance than the perishable wealth which he is employed in creating or accumulating. In brief, Mr. Ruskin believes and teaches that man, even on earth, has higher duties to perform, higher results to aim at, and higher rewards to gain, than are either indicated or inculcated in the teachings of the modern expounders of the science of national wealth. He opposes the perversion of the science, not its principles; and this perversion is accomplished when political economy is held to justify the transgression of the Ten Commandments, and the suppression of that higher law of morality revealed and inculcated in the Sermon on the Mount.

Mr. Ruskin's politico-economical opinions are contained in several distinct treatises, but they are also diffused throughout the whole of his books. They may all be described as having the eradication of human vice, and the Godward development of human nature, for their sole object. Mr. Ruskin is remarkable not more for his eloquence than for the profound and lofty humanity of his nature. His tenderness towards the poor is one of the mainsprings of his indignation at the prevailing style of our domestic architecture. This tenderness frequently crops up quite unexpectedly, to the surprise and sometimes the inconvenience of his hearers or readers. Thus at Edinburgh, when pointing out the preferableness of the Gothic porch to the Greek portico as an entrance to our houses, he adds, after dilating on its superior architectural recommendations:—"And if now and then a wayfarer found a moment's rest on a stone seat on each side of it (the Gothic porch), I believe you would find the insides of your houses not one whit the less comfortable; and if you will answer me, that were such refuges built in the open street, they would become mere nests of filthy vagrants, I reply, that I do not despair of such a change in the administration of the poor-laws of this country, as shall no longer leave any of our fellow-creatures in a state in which they would pollute the steps of our houses by resting upon them for a night. But *if not*, the command to all of us is strict and straight, 'When thou seest the naked, that thou cover him, and that thou bring the poor that are cast out to thy house.*' Not to the workhouse,

* Mr. Ruskin, since this was written, has given evidence in support of Turner's goodness of heart.

* Isaiah, lvii. 7.

observe, but to THY house; and I say it would be better a thousandfold that our doors should be beset by the poor day by day, than that it should be written of any one of us, 'They reap every one his corn in the field, and they gather the vintage of the wicked. They cause the naked to lodge without shelter, that they have no covering in the cold. They are with the showers of the mountains, and embrace the rocks for want of shelter.'""*

His indignation at what he considers the perversion of political economy finds expression in some very striking phraseology. The placing of the maxims of modern political economy in opposition to or in dominion over the beneficent promptings of the human heart, and the imperative injunctions of the Christian religion, he regards as the peculiar and prevalent infidelity of England at the present day.

"The form which the infidelity of England especially has taken is one hitherto unheard of in human history. No nation ever before declared boldly, by print and word-of-mouth, that its religion was good for show, but 'would not work.' Over and over again it has happened that nations have denied their gods, but they denied them bravely. The Greeks in their decline jeasted at their religion, and frittered it away in flatteries and fine arts. The French refused theirs fiercely, tore down their altars, and broke their carven images. The question about God with both these nations was still, even in their decline, fairly put, though falsely answered. 'Either there is or there is not a Supreme Ruler; we consider of it, declare there is not, and proceed accordingly.' But the English have put the matter in an entirely different light. 'There is a Supreme Ruler—no question of it—only he cannot rule. His orders wont work. He will be quite satisfied with euphonious and respectful repetition of them. Execution would be too dangerous under existing circumstances, which He certainly never contemplated.'"

Mr. Ruskin continues:—"I had no conception of the absolute darkness which has covered the national mind in this respect until I began to come into collision with persons engaged in the study of economical and political questions. The entire *naïveté* and undisturbed imbecility with which I found them declare that the laws of the devil were the only practicable ones, and that the laws of God were merely a form of poetical language, passed all that I had ever before heard or read of mortal infidelity. I knew the fool had often said in his heart, there was no God; but to hear him say clearly out with his lips, 'There is a foolish God,' was something which my art studies had not prepared me for. The French had, indeed, for a considerable time hinted much of the meaning in the delicate and compassionate blasphemy of their phrase, '*le bon Dieu*,' but had never ventured to put it into more precise terms."

"Correlative with the assertion, 'There is a foolish God,' is the assertion, 'There is a brutish man.' As no laws but those of the devil are practicable in the world, so no impulses but those of the brute (says the modern political economist) are appealable to in the world. Faith,

generosity, honesty, zeal, and self-sacrifice are poetical phrases. None of these things can in reality be counted upon; there is no truth in man which can be used as a moving or productive power. All motive force in him is essentially brutish, covetous, or contentious; his power is only power of prey—otherwise than the spider he cannot design, otherwise than the tiger he cannot feed. This is the modern interpretation of that embarrassing article of the Creed, 'The Communion of Saints.'"

The politico-economical opinions of Mr. Ruskin are not of recent adoption. More than twenty years ago he embodied them in one of the finest fairy tales in the language. It is called "The King of the Golden River; or, the Black Brothers." The scene of this tale is laid in Styria. The personages are three brothers, Hans, Schwartz, and Gluck, and the King of the Golden River. Hans and Schwartz are hard-fisted and still harder-hearted farmers. They are intended as types of the inhospitable and merciless men of wealth. Gluck, the youngest brother, is a sort of boy Cinderella, who receives more kicks, cuffs, and hard words than food or wages. He is the very opposite of his brothers. By means of a sudden flood, the wealthy farmers are reduced to complete destitution. Poor little Gluck hires himself to a goldsmith, and his two brothers live upon the produce of his industry. While engaged at his work, an apparition rises out of the melting-pot, which tells Gluck that by pouring three drops of holy water in the source of the river, it will for him be changed unto a golden river. Gluck informs his brothers of this vision. Each of these resolves to be the first to comply with the condition which is to change the stream into gold. So Hans goes and steals a whole bottleful of holy water. In his ascent to the source of the stream, he meets a poor dog dying from the effects of thirst; but hard-hearted Hans will not give him a drop. He next meets a worn-out old man, also perishing for want of water; but Hans treats the old man as he treated the dog. Still further up the steep and flinty mountain-path he meets a little child evidently gasping forth its last breath, through the effects of excessive thirst; but the child fares no better at the hands of Hans than fared the old man and the dog. At length he reaches the source of the river, and pours the remains of his bottle (the rest was drank by himself on his way up) into the spring-head of the river. But the stream rejects the impious offering, and Hans himself is transformed into a black stone.

Schwartz starts next upon the same expedition, but instead of stealing the holy water, he buys some of a bad priest. Schwartz encountered the same adventures, exhibited the same heartlessness, and underwent the same fate as Hans.

It was now Gluck's turn to try his fortune. This he did, but instead of either stealing or buying the holy water, he obtained some by the mere asking from a good priest. The petitioners for Gluck's charity are reversed in the order of their appeals to him. First he meets the little child, then the old man, and both of whom are promptly and unhesitatingly relieved. At length he meets the poor

dog. But by this time his stock of holy water is reduced to no more than three drops. Gluck is sorely tempted to pass on and leave the perishing animal to his fate. But a second look at the poor panting creature conquers this inclination. "Confound the gold," exclaims the kind-hearted Gluck, "I can do without it, but I cannot see this poor dog perish for want of the water which I have to bestow." He pours the three drops of holy water into the mouth of the dog, when lo! what was a moment before but a dying cur is changed into the King of the Golden River. Hans is startled, but the King tells him that he has nothing to fear, bids him look to the ground, where he espies a lily, on one of the leaves of which were just three drops of dew which the heat of the sun had not yet caused to exhale. "Take these," said the King, "and pour them into the source of the river." He did so, and the stream from that moment became unto little Gluck a river of gold.

The moral of this delightful story, of which we have given but the bare skeleton, is that "the water which has been refused to the cry of the weary and dying is *unholy*, though it had been blessed by every saint in Heaven; and the water which is found in the vessel of mercy is *holy*, though it had been defiled with corpses."

In the course of this article our object has been to acquaint our readers with the theories of this deep thinker and eloquent writer, by means of his own words. We have endeavoured, too, within a brief compass, to let Mr. Ruskin be his own expounder. In conclusion, we have only to observe, that though we are very far from holding him to be an infallible guide on any one of the manifold subjects which have been the themes of his brilliant discourses, we do hold and maintain him to be a most honest and enlightened one. More than this, we believe him to be one of the healthiest writers in our language. We know of no better moral tonic, no more effectual counteractive to the enervating influences of the fashionable and popular literature of the present day, than the works of Mr. Ruskin. In addition to this, there is, in the purity of his style, the genial play of his fancy, and the regal opulence of his imagination, a charm which cannot but commend his productions to every properly educated intellect. Though still a comparatively young man, he has already gained for himself a lofty and permanent place in the literature of his country. But literature with him is entirely subordinate to the moral and spiritual amelioration of his fellow-creatures; and the chief, if not sole, aim of his books is to overthrow the worship of the false and the impure—establish the religion of the good, the true, and the beautiful—to teach the artists of his native land the principles and practices which conduce to real excellence, and the people and rulers that wisdom which never relies upon evil for the attainment of their object—that humanity which is never deaf to the cry of the oppressed—and that righteousness, as a rule of action, without which a powerful nation is a nuisance and a pest, which in the eternal interests of the human race it is a bounden duty to destroy, unless repentance and reformation shall render it worthy of a place in the moral economy of the universe.

PUBLIC MONUMENTS.

PYRAMIDS.

WE resume the question, What monument shall be erected to a man whom a nation delighteth to honour?

Every people will have its own method of expressing its appreciation of merit, whatever phase it may assume; but all agree that the memory of the virtuous dead should be preserved in some enduring form that shall appeal to the public eye, and tell to future generations how nobly some men have lived, and how highly their labours have been appreciated by others. The services to be commemorated will be various. One man will have explored unknown countries, will have increased our knowledge of the habitable globe, and opened up new fields of enterprise and wealth for mankind. The eye of another will have penetrated the arcana of the heavens, mapped out the face of the sky, and made the stars the sign-posts for ocean voyages. Another will have brought to light some hidden treasure that has been buried in the earth since the rocks were formed, and supplies us with a new metal or other commodity. Science, too, has its heroes; religion, its saints and martyrs; literature, its sages; inspiration, its poets; government, its good kings and princes, and its wise statesmen; and after all these come those patriots "who for their country's good in fighting fields were prodigal of blood." These and many more will have claims on the gratitude of mankind which every noble nation is proud to pay. Neither is humanity niggardly in meeting this debt, as the numerous monuments of every nation, ancient as well as modern, sufficiently attest. The form of giving expression to the feeling has changed, but "one touch of nature makes the whole world kin" upon this sentiment.

It seems vain and ridiculous to us for a man to erect his own monument, and yet some of the greatest tombs and trophies in the world are said to have had no other origin than this. The pyramids of Egypt, if we may credit historians, were built by kings *as sepulchres for themselves*. And the buildings, when explored, have afforded some evidence to this effect. And yet they are certainly the most wonderful monuments that the skill and industry of man have ever raised.

Every one knows the account given by Herodotus of the building of the Great Pyramid; how Cheops closed the temples, stopped the sacrifices, and made everybody work for him; how one hundred thousand men were employed at a time, and were relieved by the same number at the end of three months; how ten years were spent in constructing the road leading to it, and twenty on the pyramid itself; how he saw the inscription engraved upon it which told how much had been expended in vegetables to feed the builders, which amounted to one thousand six hundred talents of silver, and how he was amazed at the greatness of the sum that must also have been expended in iron tools, bread, and clothes for the labourers during the whole long course of years over which their labours extended. He enumerates, also, amongst the wonderful things pertaining to those buildings, subterranean struc-

tures, which he again mentions as made by the king for purposes of sepulture, in an island formed by the waters of the Nile, which he introduced into them by a canal.

In the very first dawn of history, then, in what seems to us the morning of the world, stand those pyramids, the first great landmarks on the shores of time. They are not only the oldest, they are the greatest monuments of the world. Their representing the toil of a hundred thousand men for thirty years is not the only significant thing about them. They present us at the very dawn of history with a great kingdom that is rich enough to afford this immense industrial army to labour for so many years upon a non-productive work. But they do even more than this—they tell us of architects in whose brains vast conceptions were formed; of engineers who understood all the mechanical appliances; that reading, writing, mathematics, astronomy, the use of iron, gold, and precious stones were known to them. "At that time," says a popular writer, "men were living very much as we do, without some knowledge that we have gained, but in possession of some arts which we have not. They confound us by their mute exhibition of iron tools and steel armour, their great range of manufactures, and their feasts and sports so like our own. In their kitchens they decant wine by a syphon and stew their sweet cakes with seeds, and pound their spices in a mortar. In the drawing-room they lounge on *chaises-longues*, and the ladies knit and net as we do, and darn better than we can. I saw at Dr. Abbott's a piece of mending left unfinished several thousand years ago, which any Englishwoman might be satisfied with or proud of. In the nursery the little girls had dolls—jointed dolls, with bunchy hair and long eyes, as our dolls have blue eyes and fair tresses; and the babies, not the little bow-wow dogs which yelp in our nurseries, but little wooden crocodiles with snapping jaws. In the country we see the agriculturalist taking stock, and in the towns the population divided into castes, subject to laws and living under a theocracy long before the supposed time of the Deluge. There is enough here to teach us some humility and patience about the true history of the world."*

It is pleasing to us to know that the builders of those vast monuments were not sunk in barbarism, nor lost in a dark superstition. They worshipped one supreme God, and the highest object set before them was purity of life and rectitude of conduct. Their highest aspirations were directed to the glory and favour of God in this life, and acceptance with him hereafter. Their conceptions of death were that it was a passage to an eternal existence. Doubtless there was evil in the world then as now, for the leprosy of sin is universal; but we are glad to know that the people to whom civilization is so much indebted for the arts and sciences which ennoble mankind had their seasons of joy as well as ourselves, and that they did not live to curse their breath nor die without hope.

It will give us an exalted idea of the inventive faculty

of this great people if we reflect on the thousand difficulties which stood in the way of the first workers in iron and stone; and be it remembered those Egyptians wrought in the very hardest materials—granite, serpentine, and porphyry. They also used large stones in all their buildings. When Abdallatif, the Arabian, was in Egypt (A.D. 1196), he saw the sappers, miners, and quarrymen of the Sultan Melie-alaziz Othman-ben Yousouf endeavouring to destroy the pyramid. "Observing one day," says he, "what extremely heavy work it was to remove a single stone, I addressed one of the superintendents who was directing the workmen, and put this question to him. 'If any one offered you a thousand pieces of gold to replace one of these stones, and adjust it as it was before, do you think you could accomplish it?' His answer was, that if many times as much were offered, they could do no such thing; and this he affirmed with an oath." Yet these vast blocks of granite were cut, polished, and many of them covered with inscriptions, transported over great distances, and finally raised four hundred and fifty feet high to the top of the Great Pyramid. Such were some of the great difficulties overcome by those famous builders in the Valley of the Nile, many centuries before the days of Abraham. And the story of what they did and how they did it, together with their daily life, their purpose in this world, their faith in the future, they have painted in imperishable colours upon the sides of their graves and temples, and it remains there now, fresh as when the hand of the artist left it.

According to the measurement of General Vyse, the present perpendicular height of the Great Pyramid is 450 feet 9 inches, and its present base 746 feet. It is about 30 feet lower than it was originally, in consequence of much of the outer masonry having been torn off, as well as the casing-stones; and its base is likewise smaller. General Vyse gives the former height as 480 feet 9 inches, and the former base as 764 feet. Like all the other pyramids, it faces the cardinal points. At the completion of the pyramids, the faces were smooth and polished, but now they present a series of great steps, and are much broken. It is difficult to give an idea of the vast dimensions of this structure to the ordinary reader. Imagine a base covering the whole area of Lincoln's-Inn-Fields and of the row of houses that surround it, tapering gradually upwards until the summit is nearly 500 feet above the ground on which we are standing; that the whole of this mass is composed of huge blocks of stone, some of them scores, if not hundreds of tons weight, that have been brought from far-distant quarries, and raised here with consummate skill, to appease the vanity of one—if historians speak truly—bad man.

Of the interior structure of the pyramids we know much, but certainly not all. Several passages and chambers have been discovered which had formerly been used as tombs, but the contents of the greater part of the building are at present only guessed at. It is said that when a pistol is fired in one of the chambers, that there are scores of echoes and vibrations, which indicate that there are many hollow portions that no one has yet been able to

* "Eastern Life, Past and Present."

penetrate. It is not improbable that the edifice is honey-combed with chambers.

On the grand and imposing effect of those structures, the Arab writer before referred to says: "The form which has been adopted in the construction of the pyramids, and the solidity which has been given them, are well worthy of admiration. It is to their form that they owe the advantage of having resisted the hostility of centuries, or rather it seems as if it were time which had resisted the opposition of these eternal edifices. Indeed, when we meditate deeply on the construction of the pyramids, we are compelled to acknowledge that men of the greatest genius have here employed in combination their best powers, and that the subtlest minds have exhausted their deepest resources; that the most enlightened souls have exercised in profusion all the abilities that they possessed which could be applied to those constructions, and that the wisest theory of geometry has employed all its means to produce these wonders, as the last point of astonishment which it was possible to reach. Thus we may say that these edifices speak to us now of those who reared them, teach us their history, open to us in an intelligible manner the progress which they had made in the sciences and the excellence of their abilities;—in a word, they put us in possession of the life and actions of the men of former days."

An absurd idea seems to have taken possession of the Mahometans in the twelfth century—namely, that those pyramids and tombs of the early kings of Egypt contained immense treasures. Hence their desire to demolish them. For this purpose whole armies of sappers and miners were sent to pull them down; but all they attained, after months of toil, was a mere breaking of the superficial casing. As the old Arab author from whom we have been quoting says, "Far from obtaining the result they had anticipated, and succeeding in their design, they ended by doing nothing but spoiling the pyramid and evidencing their own powerlessness. When one looks at the stones brought down in the course of the demolition, one is persuaded that the pyramid has been destroyed from its foundation; but when, on the other hand, one looks up at the pyramid, one believes that it has suffered no injury whatever, and that nothing has happened but the paring off of a portion of the casing of one of the sides."

The great calamity, however, which we have to deplore in the destruction of the external casing of the pyramids, is that the inscriptions that they once bore are now irretrievably lost. The same authority last quoted, in another part of his work, says—"These pyramids are constructed of great stones, from ten to twenty cubits long, and two or three cubits in breadth and thickness. The most admirable particular of the whole is the extreme nicety with which these stones have been prepared and adjusted. Their adjustment is so precise, that not even a needle or hair can be inserted between any two of them; they are joined by a cement laid on to the thickness of a piece of paper; I cannot tell what the mortar is made of, it being of a substance entirely unknown to me. *These stones are*

covered with writing in that unknown character whose import is at this day wholly unknown. I have not met in Egypt with any person who could say that he knew, even by hearsay, of any one who understood this character. These inscriptions are so multitudinous, that if those only that are seen on the surface of these two pyramids were copied upon paper, more than ten thousand pages would be filled with them." Here, then, is matter for deep and lasting regret. It is not that barbarous hands attempted to destroy what noble men thousands of years before had erected, but it is that the earliest known record of the world's history perished in that atrocious sacrilege. Nor can those precious relics ever be restored, and we are obliged to have recourse to the traditions preserved by Herodotus, Diodorus, and other historians, and a few fragments of hieroglyphic inscriptions, for all we know of the building of those wonderful edifices. With the usual positivity which belongs to all researches into primitive history, we learn that it is not quite certain that Cheops built the Great Pyramid at all. Bunsen, quoting Diodorus, gives the following totally different tradition of the builders of the three great pyramids, which he says is certainly worthy of attention. Armæus built the first, Amosis the second, and Maron the third. But be this as it may, the demolition is still going on. Bunsen says (vol. ii. p. 105):—"The history of the mutilation of these wonderful works of Menes proves that curiosity and a hope of finding hidden treasure induced the Caliphs to force an entrance into them. In later times, principally under Saladin, the pyramids, and their casing more particularly, were regularly used as stone-quarries. Mameluke violence and love of destruction completed the sacrilege as far as the giant masses would permit. The present Government builds cotton manufactories and powder magazines out of the tombs of the old Pharaohs."

There are at Geezeh three great pyramids; we have already given the dimensions of the first, and the second is only 24 feet 6 inches less in height. Its dimensions were—base, 707 feet 9 inches; in perpendicular height, 445 feet 3 inches. The third is of less dimensions than the second. They have all been opened; and it is certain that the second was the tomb of Chephren or Shafre, for although the Arabs who broke into the sepulchre chamber in the twelfth century opened the sarcophagus and carried away or destroyed the mummy, fortunately a piece of the coffin and the finger-ring of the king whose tomb it was have lately been discovered, with his name painted on the one and engraven in the other. It is thus that those simple fragments, the wreck of hoary antiquity, restore to us again a dynasty that had long been forgotten, and the purpose for which they erected those vast structures which have ever since been reckoned the world's greatest wonders. There are a great number of pyramids besides those already mentioned, but for the purpose we have in view it is not necessary to describe them.

It may, we believe, be taken for granted that the pyramids were not built to gratify the vanity of one tyrant, if indeed tyranny had anything to do with the matter; but that they were erected as family sepulchres

for the great kings who were then reigning over a mighty and prosperous nation. To us it is an ancient fiction, that despots who would only be remembered to be hated built those monuments to themselves, since no one else was likely to honour them. We rather incline to the belief, spite of all that Herodotus has said to the contrary, that they were raised by willing hands and paid for in sterling coin. No people could have been so great, and at the same time so debased, as those early Egyptians are represented to have been.

But apart from these speculations altogether, those time-defying monuments of primæval ages are before us; and although the inscriptions that they once bore have perished, their own mute appeal is as eloquent as ever. What is their meaning? They are significant of tranquil, eternal, indestructible repose. It was a grand struggle to battle successfully with the mutations of time, and embody the eternal essence of the soul in the perishable works of man. It was a gigantic effort of the mind to triumph over the dissolution of the body, and inform posterity in remote ages that a mighty nation once dwelt here. And in this they have been eminently successful. "All things dread time, but time dreads the pyramids," says Abdullatif. They have triumphed over five thousand years, have survived the mutilation of the Caliphs and their successors, and they will in all probability maintain their grandeur when the followers of the Prophet shall, like the Druids, have passed from the face of the earth; and other races having other creeds shall gaze upon them with the same wonder that we now regard their vast proportions. Already they have outlived nations, civilizations, religions, and even races of mankind, and they seem destined to outlive all others that we now behold.

Whatever our admiration for these structures may be, they can never be rivalled, perhaps never imitated. It is the only thing that antiquity has bequeathed to us that we may not hope to place ourselves on a par with them. In poetry, philosophy, mathematics, and mechanics, we may compare ourselves with the great nations of the ancient world, and claim an excellence to which we are justly entitled; but in building, sculpture, and some other arts, they were undoubtedly our rivals. At all events, no modern nation will ever think of attempting to rival Cheops in his wonderful undertaking. Once for all, men have extracted the all-consuming tooth of time. We can only guess at the period when the pyramids were built. It may be five thousand years ago; it may be more; but the period of their destruction is more incalculable still, they appear firm as the everlasting hills, and may, for what we know, last for ever. They are the greatest, the most enduring works of men, and with our present thoughts and appliances are inimitable.

HISTORICAL VALUE OF ARCHITECTURE.—Architecture is the printing-press of all ages, and gives a history to the state of the society in which it was erected, from the cromlech of the Druids to those toyshops of royal bad taste—Carlton House and the Brighton Pavilion. The Tower and Westminster Abbey are glorious pages in the history of time, and tell the story of an iron despotism, and the cowardice of unlimited power.—LADY MORGAN.

STUDIES OF MODERN ARCHITECTURE AT HOME AND ABROAD.

No. II.

BY G. R. BURNELL, ESQ.

IN Count Léon de Laborde's Report upon the operations of the French Commission to the Exhibition of 1851, that eminent critic mentioned one fact which may explain to a great extent the singular uniformity of taste to be observed in the buildings erected during the period of the Empire and of the Restoration. This consisted in the law by which local authorities were obliged to submit to the Conseil des Bâtiments every project for works supposed to exceed in value the sum of 40%. In 1821, the limit of independent action of the local authorities was extended to 800%; but all buildings presenting anything like a decorative character were still subject to the supervision of the Conseil. Necessarily, under such a system, the architecture of our neighbours assumed a dry, academic character, devoid of local inspiration and of originality, even whilst it was maintained within the limits of school traditions. When the Revolution of 1830 burst upon Europe, the reaction against the principle of authority that movement represented led men, however, to turn aside from all the old models they had been taught to worship; and practically to adopt as a maxim that whatever had been patronized by the state, as personified by the later dynasties, was an indication of the servility of its followers. Partially on this account, and partially on account of the revived interest with which artists and philosophers alike turned back to the history and archæology of the middle ages, the French architects were led to study and to reproduce the arts which had then prevailed, for in many respects they were markedly different from those of the periods when monarchy was in its apogee. Periods of great political excitement and trouble are not, however, adapted to the advancement of peaceful art, and so the buildings of the first years of the reign of Louis Philippe can hardly be said to have borne any distinctly marked character exclusively their own, although the grave questions of morals and religion were dragged into the full glare of public discussion, and were treated with a boldness and a want of deference to precedent or authority we must even now consider startling. It is fair to suppose that this rage for psychological inquiries must have reacted upon the artistic expression of the age; for the religion of *Le Père Enfantin* certainly nourished such men as Michel Chevalier, the *Perères*, *Felicien David*, *Fould*, &c., who subsequently have played so distinguished a part on the world's stage. But society was in far too disturbed a state during the early years of the reign of the Citizen King, and for his own political purposes Louis Philippe affected too great an admiration of the tastes and habits of the "*bourgeoisie*," to allow him to devote much attention to the character of the architecture patronized by the state; whilst at the same time the feeling of uncertainty, the want of confidence in the stability of the Government, prevented any useful action of private parties upon the external expression of the arts of design.

About this period, however, the movement in favour of the reproduction of the forms of art adopted in the mediæval period had become generally fashionable, instead of being, as it were, the characteristic of a peculiar literary school; but both in France and in England the phase of mediævalism which was received with the greatest favour during the period between 1830 and 1836 was that of the respective local revivals of the later portions of the sixteenth century; in civil buildings at least. The tendency to regard the architecture of the thirteenth century as exclusively "Christian" was, in the meantime, making way amongst the partisans of the principle of authority in religious matters; and, perhaps by a natural consequence of their mode of reasoning, they were led more and more to regard the form of art which prevailed when the Church was all-powerful as the one most fitted for ecclesiastical structures. The pseudo-Greek and the pseudo-classical schools of England and of France nevertheless retained a strong hold on the public administrations of the two countries, and the General Post Office, the British Museum, the London University, the National Gallery, the Fishmongers' and Goldsmiths' Halls, the Downing College, the University Library, and the Fitzwilliam Museum, Cambridge (although, perhaps, the latter may be of rather a later date than the one immediately under consideration), may be cited as illustrations of the taste prevailing here in high quarters; whilst in France the Government was so much engaged in the struggle with the Revolution, that it was only able to finish the monuments commenced by its predecessors, and to mark its own tendencies by such operations as the erection of the Colonne de la Bastille, the fountains and the obelisk of la Place de la Concorde, the levelling of some of the quays, the construction of some flimsy wire suspension-bridges, and the construction of some buildings of mark in the provinces, such as the Custom-house of Rouen, &c. Emphatically, the period between 1830 and 1836 was a barren one for art throughout Europe, and though it may have served to rouse the nobler faculties of men's minds by causing them to examine themselves, and the reasons for the faith which was in them, it was not until society had again resumed a stable form, and men began to weary of the incessant feverish excitement of those sad years, that the arts of peace and civilization began once more to reassume their sway. It is also to be observed, that the political agitation which thus retarded the artistic progress of the leading nations of Western Europe did not spare the secondary ones. Spain, Portugal, Belgium, Holland, were then either passing through the crisis of a transition from despotic to constitutional government, or of a violent disruption of a previous union, accompanied by the evils of civil war or of foreign intervention. Russia, too, had her struggle to maintain with Poland; Italy was either sunk in apathy or occasionally quivering under the detested rule of the foreigner. Germany was more tranquil, and it was precisely there that architecture seems to have been cultivated with the most success in the period alluded to; and the monuments then erected in the Prussian, Bavarian, Austrian, and Saxon cities, supply the only evidence of the

continued activity of the progressive development of the art. Unfortunately, however, the rigid pedantic spirit of German æsthetics, and the tendency of the German artists to substitute archæological investigations for the enthusiastic studies of the eternal laws of beauty, combined with the fatal influence of the sneering scepticism of Goethe and of his pupils, all tended to deprive the German school of this period of the spontaneity of feeling, and of the frank earnestness of devotion to art for art's sake, without which nothing truly original or great can be produced.

After 1836, the government of Louis Philippe succeeded in mastering for a time the revolutionary parties of France; England began to settle quietly into the new order of things produced by the great change in her constitution by the Reform Bill; Belgium began to assert her nationality by entering on a vigorous course of internal improvement, under the guidance of the able, judicious king who has for so many years carried her through the difficulties of her position. Italy and Spain were still in the throes of foreign occupation, of divided rule, or civil war; but their agitation did not sensibly affect the rest of Europe, whilst the great German race continued the work of intellectual national centralization which is one of the most marked tendencies of the age. There was, in fact, a lull in the storm of politics, and the great conquests of peace diverted men's attention from the more exciting and more costly agitations of the preceding lustre; for it was about 1836 that the system of railway locomotion, so brilliantly inaugurated in England in 1825, began to be seriously adopted on the Continent. Vinet remarked that there is a tendency in societies exempt from great excitements to return to the romantic; and it is curious that the productions of the period between 1836 and 1848, during the lull between one democratic outbreak and its successor, should precisely have borne this character. Throughout the civilized world, in fact, at this time, men seem to have turned aside from the study of the great models of antiquity in art and in literature, and from the attempt to discover and apply the somewhat cold and simple laws of harmony and proportion, in order to follow the more picturesque and capricious forms of art which had arisen in a previous period of transition. Our own Houses of Parliament, the alterations of the Hotel de Ville of Paris, with the extension of the Ecole des Beaux Arts, and the completion of the works of Cologne Cathedral, may be cited as amongst the most marked illustrations of the spirit of the times. But a rather curious difference seems to have prevailed in these three great nations in the period of Mediæval art they respectively selected as their models. In England, after trying all the styles of the so-called Gothic architecture, public opinion seemed to have settled into a decided preference for the variety known by the name of the "Decorated Pointed" (we speak of the interval between 1836 and 1848). In France, the Renaissance of the end of the fifteenth and the beginning of sixteenth centuries was adopted; whilst in Germany, the form of Mediævalism selected for imitation was the one known on the Continent by the terms *Romane* or *Byzantin*, "*Romanische Byzantinischer Baustyl*." In all of them,

however, the tradition of the classical and of the pseudo-classical schools of the Italy of the sixteenth century struggled to retain their hold on the public mind, with gradually waning power, and with less and less sympathy on the part of the public. In England, the church architecture became, under the influence of the Ecclesiological Societies, exclusively Mediæval; and an unblushing system of copyism of the productions of an extinct form of civilization and faith prevalent in the feudal times only was substituted for an equally lifeless and unmeaning copyism of the forms of Grecian architecture; because, according to the leaders of this movement, the Mediæval form was exclusively "Christian!" In France, the ecclesiological revival did not gain the ascendancy till a much later period; and though Messrs. de Caumont, Lassus, Lenoir, Viollet le Duc, had laboured earnestly to spread the taste of the Mediæval art of their own country, and the Ministers of Worship and of the Interior in the later periods of the reign of Louis Philippe had materially aided this movement by encouraging in every way the restoration of the historical monuments of the country, it was only about the year 1847 that the municipal authorities of Paris were induced to accept the designs prepared by Messrs. Gau and Bally for the Church of St. Clotilde, in the style of the thirteenth century, as practised in the Ile de France. In Germany, the same course of events may be observed to have taken place, and the schools of Schinkel and Von Kleuze retained possession of power long after the construction of such buildings as the Church of Bulach, by Hubsch; the Markuskirche of Berlin, by Stuller; the Petrikirche, by Strack; and the Michaelskirche, by Soller (both of the latter churches are in Berlin), had been completed, amidst the applause of the archæologists of the whole of the Teutonic race, and the Byzanto-Romanesque style only established its undivided sway in ecclesiastical architecture at a late portion of the epoch we are considering. In the meantime, the pseudo-classical school retained in all the nations we have referred to its influence upon the secular architecture of the towns at least, assuming a much more picturesque and, so to speak, a much more romantic character than it had formerly borne under the influence of the traditions of the classical Grecian revivalists. The London club-houses display this tendency, and the administrative palaces of Paris also indicate its existence; whilst the private and public secular buildings of such towns as Berlin, Dresden, Mainz, Munich, or even those of Genoa, Turin, Milan, Florence, &c., erected about this time, are all impressed, more or less, by the same intellectual stamp.

The marked affectation with which the ecclesiological critics upon architecture apply to their favourite style the term "Christian" has always seemed to us to be one of the most striking illustrations of the power of unhesitating assumption upon the public mind. This class of authors gravely claimed for the Mediæval architecture the peculiar merit of being the only true impersonation of Christian feeling in buildings; and the general public, forgetting, or being ignorant of the fact, that Christianity had prevailed as the dominant religion of the Roman Empire from the year 330

to its extinction, and that during the Carlovingian period, from about 800 down to nearly 1100, the round arched style had reigned with undivided sway, credulously adopted the belief that the pointed arch had some mysterious connexion with their religious faith. Surely the Christians of the Catacombs were as truly Christians as the dwellers under feudal rule, and the contemporaries of St. Augustine or of St. Athanasius were as worthy of that title as those of Abailard, St. Bernard, or Roger Bacon could have been. Nor can any valid reason be assigned why such monuments as San Clemente, at Rome—St. Vitale, at Ravenna—San Giorgio al Velabro, at Rome—the Church of Grotta Ferrata—or that of San Miniato, near Florence, &c., should be excluded from the pale of Christian art. The fact seems to be, that the leaders of the mediæval revival were at the same time deeply interested in the movement for the extension of the ecclesiastical power, represented in England by the Puseyite agitation, and in France by the Ultramontane party; and it is curious that in the countries where the church had always retained her sway—as in Spain and Italy—there the term "Mediævalism" has never been regarded as synonymous with the term "Christian" in matters connected with art. It would, indeed, seem as though there were some vague perception of the relations between the forms of faith and the forms of art in the minds of those who participated in this religious agitation of the north-west of Europe; and that the style of architecture which had prevailed during the period of the church's greatest power was regarded by them as an exponent of the religion that church was organized to serve. On these principles it is possible to explain their preference for the particular form of art they had adopted; but it is not so easy to explain the conduct of the general public in accepting the dogmas of this school, and in tolerating the application of its verbal formulæ to the science of architecture. The Decorated Gothic was indeed characteristic of the Christianity of the Middle Ages; it is sheer nonsense to talk of it as the only "Christian art." It were as reasonable to talk of the Van Eycks and the Hemmelings, the Giotto and Cimabues as Christian painters, to the exclusion of Raphael, Michael Angelo, Van Dyck, Murillo, or even of Guido and Pietro da Cortona, who were at least sincere believers, if not first-rate artists. Be this as it may, the notion that Mediæval architecture is exclusively Christian has had much to do with the universal adoption of that style for church buildings, and the more important question of the appropriateness of its application to the Protestant form of worship has been left entirely aside by the English revivalists.

The best proof of the fictitious nature of the mediæval revival is, perhaps, to be found in the fact that, practically, it has not been extended to civil architecture; and that, whenever it has been necessary to provide for the daily wants of society, architects have been forced to continue the system they had so long adopted—viz., that of developing the principles of classical art in accordance with the feelings and wants of the passing times. The revived cultivation of what may properly be called picturesque,

romantic architecture (instead of Christian architecture), has, however, done good in this respect, that it has led to the conviction that a mere servile imitation of even the purest form of art, the Grecian, was inappropriate in a climate such as our own; and, under the influence of the effects produced by the observance of the canons of taste observed during the middle ages, our architects have been gradually led to modify the lessons they have learnt from their classical teachers, so as to appropriate some of the picturesque feeling of the rival school. Even Sir R. Smirke himself was obliged to attempt the infusion of the romantic mode of thought into some of his later works; and in the portion of King William-street between the statue and the Mansion House, he evidently strove to combine the chaste and simple harmony of Greek forms with the feelings of his age, and the conditions of the London atmosphere. Messrs. Cockerell, Tite, Hardwicke, Basevi, Barry, Elmes, Pennethorne, S. Smirke, P'Anson, &c., had accepted the change in public taste more unreservedly than their predecessor had done; and, whilst still clinging to the spirit of classical art, they leant in preference towards the modification of it which had been adopted in Northern Italy by such men as Palladio, Scamozzi, and the great architects of the Venetian school. The English buildings of this period exhibit much thought, and a conscientious study of the æsthetical and practical conditions they involved; and even the lovers of Mediævalism must allow that the Exchange, the Fitzwilliam Museum, the St. George's Hall, Liverpool, the Reform Club, the Sun Fire Office, Cornhill, &c., displayed an earnest effort on the part of their authors to eliminate a form of art suited to their times, but which, perhaps unconsciously, bore unmistakable evidences of the influence of the revived love for mediævalism. The sudden development of the railway system about this period has, however, proved by no means favourable to the progress of true architecture; because, firstly, it has led to the adoption of a style which may be most aptly described as utilitarian; and secondly, because it has led to the distinct recognition of the separation between the artistic and the scientific branches of the architectural profession, between architects and engineers, which has proved so injurious to both classes. It was, indeed, precisely about this period (1836 to 1848) that the form of art applicable to railway works assumed its special character, and it would be difficult to imagine anything more deficient in taste than that character has hitherto been, in England at least, for both the French and the German engineers seem to have been educated in schools where the arts of design were not treated with neglect. The consequence of this unfortunate divorce between art and science in building operations has been, that the face of our country has been disfigured by bridges, viaducts, station buildings, &c., which are positively eyesores; as, for instance, on the Great Western, North Western, Eastern Counties, South Eastern, and Midland lines; and though Mr. Tite (who, by a singular exception, was employed on the works of the South Western and the Lancaster and Carlisle, and on some of the Scotch lines) relieved their station buildings from the general monotony

of ugliness, he was so "cribbed, cabined, and confined," by the influence of the engineers with whom he worked, that he was not able to exercise his own judgment, or to indulge his fancy in any way. Mr. Hardwicke also suffered from the same influence, and can hardly be held responsible for the absurd propylæon at Euston-square, or for the inappropriate, characterless buildings at the back of that screen. But without dwelling on individual shortcomings, it may be observed that the tendency of engineering influence was to substitute the notion of utility for that of beauty in architecture; and thus, by introducing a new and powerful motive, to increase the uncertainty of men's minds already produced by the political and moral revolutions of the previous years. In fact, the architecture of England was still, in this period, as deficient in character and as aimless as it had been in the period between 1814 and 1830; it floated about, as it were, on the surface of the moral currents of the day, but it had no definite direction of its own, and its professors were devoid of the originality and the mental grasp requisite to create a definite style.

In France, however, and in Germany, there was another spirit abroad; and they who study the history of this mode of the expression of human intellect, may discern in those countries a tendency, even whilst adopting a distinctly-marked eclecticism in art, to seek for their own formulæ to express the longings of the soul after infinite beauty. These words may appear to the unreflecting as mere empty sounds—mere metaphysical jargon; but in truth the efforts of any age or nation to attain excellence in art are inspired alone by the desire to lead through visible objects to the ideal; and the degree of excellence attained is precisely in proportion to the earnestness and the disinterestedness of the efforts. In France and Germany, the various schools of philosophy and religion had roused men to a more passionate examination of the problems of man's existence in the present and in the future; whilst the boldness with which those problems had been discussed had for many years accustomed the thinking part of the public to investigate the reasons upon which their principles and practice in other things had been founded. There was a tendency in both countries to shake off the traditions of schools, and to return directly to the study of the natural laws on which those traditions were based. In architecture, this movement displayed itself in a marked manner between 1836 and 1848; in France perhaps more decidedly than in Germany; but alike in both countries copyism was rejected, and professors strove to discover the mode of representing in their buildings the innermost feelings of the times they lived in. Visconti, Hittorf, Vaudoyer, Duban, Armand, &c., gradually passed from the traditions of the Vignola school to a style of their own times; but, alas! this style was so true a reflex of the utter absence of faith in the society which it typified, that it bore no distinct or original character of its own, and at best it appealed more to the sympathies and the passions of the public, than it did to their reason. Duban and his school have adopted a style characterized by a nakedness and baldness of general effect,

and a prodigal use of their ornamentation in detail; Visconti and the other leading architects of this time, who, like him, still retained the influence of their classical schooling, fell into another error—viz., that of overwhelming the general effect of their buildings under a profusion of rich and elegant details. There is in both these schools an absence of moral grandeur; there is a species of morbid elegance which appeals more to the nerves than to the heart, and which leaves untouched the deeper notes of the soul. Their styles are true, inasmuch as they display these men as they lived and moved and had their being, and so far the styles are respectable; but no style can be a living one unless it touch the general soul of man, and rise beyond the expression “of an age, to that of all time.” The architecture of the later portion of Louis-Philippe’s reign indeed represented the moral and the political corruption of the epoch, with all its elegance and refinement, but also with all its want of principle and its contempt of authority; it has been aptly called *le style lorette*, and may be observed in its most characteristic form in the new streets formed on the north side of the Boulevard Montmartre, and in the quartier Notre Dame de Lorette. Towards the close of the epoch, nevertheless, a better tendency may be observed to prevail, especially in the buildings connected with railways and with the public administration; for the Strasbourg Railway Station and the Hotel du Ministère des Affaires Etrangères display, in the one case, an originality of conception, and in the other a consistency in the adaptation of received forms to new wants, which almost amount to genius. The Strasbourg Railway Station was never meant to be seen from the Boulevard, from whence it is now usually looked at; but in spite of this inconvenience, it may be said, without fear of contradiction, that it has few rivals in modern Europe, whether considered from an abstractedly æsthetical point of view, or from the practical one of its appropriateness to the usages to which it is applied, and which it was intended to typify. In some of the more modern station buildings of France, it is true that the logical adaptation of forms to express the usage of the structure may have been more carefully studied; but it is precisely the impression of the vague effort to produce this result which gives to the Strasbourg station its poetical character. Altogether, there are few monuments of our age worthy of comparison with this building, in spite of one or two defects of detail, which seem to arise from a deficient scholastic training in the author of this strikingly original design.

It is worthy of remark that the architect of the Strasbourg Railway Station has furnished a strange commentary on the nature and tendency of the French mediæval revival, which, amongst the eclectics at least, is following very much the same direction as the revival in Germany. He has indeed sought his model in the round arched forms of Lombard or of Romanesque architecture, just as the architects of the stations on the Baden railways, of the principal stations at Munich and Frankfort, have done, and as the Belgian, Dutch, Danish, and Russian architects are evidently inclined to do. And for many reasons

the Lombard style may be considered to be especially adapted for the class of buildings specially alluded to, for, in the first place, it is sufficiently elastic to allow of its application to the artistic treatment of the new materials introduced of late years; and in the second, the style itself was designed to meet the requirements of an age and a country which rendered simplicity of construction and economy of technical execution matters of necessity. At the same time, the nature of the ornamental decoration archæologically consistent with this style is such as to display itself easily in the vapoury atmosphere of the countries where it has been adopted; and, indeed, from the fact of the essence of the Lombard style consisting in broad general effect, rather than in minute detail, the latter may often be advantageously omitted. This certainly is not the case with the Decorated Gothic, the modification of mediævalism most in favour with the romantic schools of England and of the Continent, as may be perceived in any of the domestic buildings erected by their followers, such as Messrs. Scott, Viollet le Duc, Roelandts, Muller, Kranner, &c.; for in all their works the general effect is overwhelmed by the details, and the means of decoration are to a great extent substituted for the ends it ought to fulfil.

A rather curious difference between the spirits of the mediæval revivals of England and of the Continent may be observed in the manner in which the repairs of the ecclesiastical and historical monuments of the various countries have been treated—a difference which has long prevailed, although it is only very recently that public attention has been called to it. Here, the architect employed in the restoration of an ancient monument considers himself bound to reproduce it precisely in the form it originally bore; abroad, the architects consider themselves entitled to change insignificant details, so as to render the buildings more appropriate to their actual use, and to allow the application of any modern improvements in technical processes. Our system is certainly more in accordance with archæological correctness, and with a reverence for the works of our ancestors; but the Continental system is more consonant with the practice of the mediæval architects themselves, and with the logical application of the principle, that buildings are intended for use, quite as much as for the pleasure of the eye, or of the imagination. As in most cases, truth lies in the mean between the two extremes, and the rigid enforcement of the doctrines of our leading restorers would lead to as unmeaning a reproduction of extinct forms of art, as the love of change indulged in on the Continent evidently destroys the time-honoured interest of the building. The reproduction, for instance, of the archaic sculpture of our Gothic cathedrals is as questionable as a matter of taste, as the demolition of the western façade of St. Ouen, at Rouen, or as some of the alterations of the original design of Notre Dame of Paris, or of Alby. Perhaps our system may also be injurious in this respect, that it drives our architects from any attempts to develop the leading principles of mediæval art in accordance with the spirit of the age in which they live, until at last they become,

like the late Welby Pugin, mere anachronisms of a very ludicrous description. But however this question be decided, architectural students must feel grateful to the government of Louis-Philippe for the efforts made by it to preserve the glorious relics of the past; and though in such cases as the restoration of St. Denis, St. Ouen, Mantos Cathedral, &c., there were undoubtedly committed some strange mistakes, yet as a general rule the work of repairing and maintaining these monuments was well and conscientiously performed in France between 1836 and 1848. In Germany the same observations will apply, and the completion of Cologne Cathedral may be referred to as an illustration of the spirit with which that nation entered upon the task of preserving the relics of its ancestors. In Holland and in Belgium the attempts at restoration executed about this period were simply detestable, whilst in Spain and in Italy so little seems to have been done for this purpose, that it is useless to seek in those countries any lessons for our guidance in this path. Alas! in art, as in politics, morals, and literature, the nations of the south, so long our leaders, have latterly abdicated their high position, and are content to learn from their ancient pupils. They have, by a strange series of events, lately become free; may they again enter upon the great struggle for intellectual advancement, for which they possess so many natural advantages in their earnestness of faith, and in their instinctive perceptions of the elements of ideal beauty developed by the influence of climates which communicate a charm to all inanimate nature! It is indeed probable that the reappearance of these two nations in the great drama of man's progress may introduce new elements in its direction, for the genius of the northern nations is as much disposed to wander into the realms of the ideal, as that of the southern nations is likely to confine itself to the real. The tendencies of their intellects are respectively subjective and objective; the interests of true art require that both should be combined.

Before closing this chapter of our review of the recent progress of architecture, it may be as well to mention that in 1837 the French Government made another effort to counteract the effect of the administrative centralization of that country upon art, by extending the independence of local authorities, in matters connected with building, to the sum of 30,000 francs (1200*l.*) The tendency to imitate Paris had, however, been too deeply rooted to allow this alteration to produce much effect; and the erection of such buildings as the Cathedral at Boulogne, the Museum at Havre, the Theatre at Caen, &c., proves that the local schools had only been too fatally absorbed by that of the capital. Neither in the period between 1837 and 1848, or since, have the French provinces produced anything original, and we look in vain amongst them for such marked distinctions as may be traced in the contemporary schools of architecture of Brussels and of Antwerp, or in the more ancient ones of Burgundy and the Isle de France.

It is as dangerous to do good to a rogue as to do evil to an honest man.—*Plautus*.

THE ÆSTHETIC PRINCIPLES OF ARCHITECTURE.

ARCHITECTURE is a branch of the fine arts which in this country was long left to slumber in the backgrounds of science, and its principles, which have such an innate tendency to elevate the mind, are but little understood. It has been left to those whose fortunes and position in life have enabled them to study in *republica scientia*—an extraordinary genius appearing once now and then on the world's stage, and like the large comets, astonishing us by their lustre, and then disappearing; but, as Shakspeare says, "the works of good men live after them," so their works still exist, the wonder and admiration of all intellects. England, as a nation, may be said to know little of architecture, and for a long time prior to the time of Inigo Jones it was in a very degraded state; but he arose and trimmed the lamp. Then the devastation caused by the Great Fire of London gave scope to the genius of Wren.

Although perhaps no country in the universe is in any way equal to our own, in respect of being dotted thickly over with miserably inartistic, though happy homes, lying like gems set about with the poetry of external nature, yet there are a few here and there in which some degree of architectural talent has been displayed, and, like the evening star, they light up and throw a halo round the surrounding atmosphere; and let us hope to see a higher impulse of architectural genius expressed in the erection of still more beautiful and sylvan retreats.

People seem to think of architecture as if it referred only to bricks and mortar, or abstruse mathematics, comprising simply crooked problems.

Surely the time shall come,
When this fine overplus of might,
No longer sullen, slow, and dumb,
Shall leap to music and to light.

So sang the prophetic voice of the poet, and he has lived to see the shaking amongst the dry bones. Our archæological societies are teaching us to look behind the broken column and the ruin, and there see the genius from which such divine conceptions emanated, and which could express itself into a material form.

In the garden of architecture, so cheering a spot to the lover of the history of our earth, reposes all that is beautiful in science; where the lofty mind of man, aspiring towards heaven, has left its noble impress; where we may obtain a glimpse of bygone nations whose history is imprinted with an indelible hand on the stones, truly verifying the poet's assertion—

Sermons in stones, and good in everything.

Let us, then, take courage with a heart for any fate; let us arise and be doing, remembering the immortal destinies of man, and the hopes that are ever surging our hearts and rising upwards.

Build on in hope, with pillar, dome, and tower,
Not for the present, but a distant hour.
Brief is the span of life; the builder eyes
His deep-thought plan, and sees the walls arise;

Anticipates the whole, and then expires,
Ere half accomplished. Yet his genius fires
The lasting pile. Not men, but nations too,
By such defy oblivion.

It concerns all to know the most interesting features of architectural beauty. Those æsthetic principles of architecture which enable us in our travels to see something more than beautiful scenery, and which in this England of ours is especially valuable from the many relics of antiquity still left us, and *in summa excellentia* to see living poetry in "those wrecks of another world whose ashes still are warm," those fallen arches and arch-crushed columns, and choked-up vaults, or in those beautiful and heaven-aspiring pinnacles and spires that flash in the sunlight like a meteor, and which seem to give us glimpses of that glory never to be forgotten—telling us, like gleams on a sunset sea, what once hath been.

The architect
Built his great heart into those sculptured stones,
And with him toiled his children, and their lives
Were builded with his own into the walls,
As offerings unto God.

Things inanimate are possessed of life; the old ruin and grey relic of antiquity, pleading haughtily for glories gone, speak in voices which most people hear not; they are like eternal lamps in the bright city of God; but—

Vanished in the ancient splendour,
And before my dreamy eye,
Wake those mingling shapes and figures,
Like a faded tapestry.

What we can see of the remote past through the deepening shades of time, is as of some great unknown sea on which some solitary ship is afloat, whose course we can but dimly trace through the clouds which every way gather around her.

How truly has it been said (in the "Seven Lamps of Architecture"), how cold is all history, how lifeless all imagery, when compared to that which the living nation writes, and the uncorrupted marble bears! How many pages of doubtful record might we not often spare, for a few stones left one upon another! The ambition of the old Babel builders was well directed for this world. There are but two strong conquerors of the forgetfulness of men—poetry and architecture—and the latter in some sort includes the former, and is mightier in its reality; it is well to have, not only what men have thought and felt, but what their hands have handled and their strength wrought, and their eyes beheld. "This is the grand æsthetic principle of architecture, the concatenation of the world's history, written in imperishable characters on the uncorrupted marble, so that all may behold, and seeing, learn if they will, 'the primal art of man.'"

Thus, in all time, from the monolithic column to the trilithons of Stonehenge, from the propylea of Pericles to the fantastic Alhambra, we behold the same spirit of beauty, the same eternal æsthetic principle of architecture. Let us for a moment go back to the origin of these principles, and we shall find that they may be traced even to the expulsion of man from Paradise. When he thus became exposed to the vicissitudes of wind and rain, of sunshine, fierce as it doubtless was, and cold in all its inten-

sity, to which among the floral bowers of Paradise he had been unaccustomed, and looking back and seeing the gates of his former home shut for ever against him, and round about him the "wide, wide world," in all the glory of its freshness, then did the new knowledge he had gained of good and evil, thrust with irresistible force into his soul the thought of what he had lost and what he had gained, and his distress gave birth to the hut; nor, let it be remembered, the unseemly wigwam, nor the grovelling thing of mud we generally think of with the word hut. No! the infancy of humanity had not degenerated to the level of the North American Indian or the Esquimaux. Was he not fresh from Eden? Did he not remember what he had lost, and would he not endeavour in some sort to get at least a resemblance of his former abode? Here, then, his primal want was supplied, and it contained in itself the elements of the beautiful, and the genius of man here first expanded itself into a material form.

STREET ARCHITECTURE IN BRICK.

THE destructive action of the London atmosphere upon stone-work leads obviously to other practical considerations, in addition to such as may be devoted to the discovery of chemical agencies for rendering stone edifices vapour-proof. While *Silicates* are passing through the test of experimental application, stone walls, with their rich and costly sculptures, are rapidly disintegrating. It certainly is possible that something or other may prove its efficacy as a preservative, and that perhaps the "Zopissa" may render Yorkshire Stone on the banks of the Thames as time-defying as the Sandstone masses that for thirty or forty centuries have reflected the same sharp chisel-touches in the rising Nile. Still, this atmospheric disintegration of apparently hard Stone significantly suggests inquiries after some substitute for Stone, which is really hard and strong and enduring, and which also would satisfy the various requirements of Architecture. Nature herself has a ready reply to every such inquiry: she points out the common clay that she supplies with lavish bounty in every region of the earth, and then glances at the *Terra Cottas* of Assyria and Greece, and the Roman bricks of Verulam.

For many reasons, at the present moment BRICK ARCHITECTURE possesses the strongest claim for thoughtful attention. In London, more particularly, the advantages attending the use of bricks in Street Buildings are numerous and palpable. The one quality of unquestionable durability in itself goes far to establish Brick Architecture in public favour. And when to this it is added that bricks may be adapted to the most artistic purposes, and used with equal propriety and success in every variety of edifice, the case in support of Brick Architecture appears to be complete. Such is actually the fact; and yet, at the same time, there are many circumstances connected with the general adoption of what we will venture to distinguish as *Victorian Brickwork*, which require to be carefully considered and fully discussed. If bricks possess the most

important intrinsic qualities as building materials, they certainly have been subjected in practice to the very extremity of ill-usage and indignity. Even in the fabrication of bricks the higher capabilities of the clay have almost universally been overlooked. Hence brickwork has come to be held as synonymous with building in its commonest, most degraded, and most un-architectural condition. The very word "brickwork," when used with reference to streets, is involuntarily suggestive either of dreary rows of half-burnt dirt made smart by "pointed" mortar, or of a structural framework that is to be elevated into what passes for Architecture by means of a careful covering of stucco. "It has been so much the fashion of late years," remarks Mr. Street ("Brick and Marble Architecture in Italy," p. 268), "to look upon brick as a vile material, fit only to be covered with compo, and never fit to be used in church building, or indeed in any buildings of architectural pretension, that I suspect many people, trusting to their knowledge of pointed Architecture in England, would be much surprised to find that, throughout large tracts of the Continent, brick was the natural, and indeed the popular, material during the most palmy days of Architecture in the middle ages." In such a state of things, any attempt to establish brickwork as building of a high order necessarily implies a complete change, as well in the making and the treatment of bricks, as in the estimation of them. The bricks themselves must be rendered capable of artistic application; and both architects and the general public require to become familiarized with their true character, their versatile powers, and legitimate uses.

"Here let me pause," writes Mr. Ruskin in his description of the Gothic palaces of Venice ("Stones of Venice," ii., 260), "to note what one would have thought was well enough known in England,—yet I could not perhaps touch upon anything less considered,—the real use of brick. Our fields of good clay were never given us to be made into oblong morsels of one size. They were given us that we might play with them, and that men who could not handle a chisel might knead out of them some expression of human thought. In the ancient Architecture of the clay districts of Italy every possible adaptation of the material is found exemplified, from the coarsest and most brittle kinds, used in the mass of the structure, to bricks for arches and plinths, cast in the most perfect curves, and of almost every size, strength, and hardness; and moulded bricks, wrought into flower-work and tracery as fine as raised patterns upon china. And, just as many of the finest works of the Italian sculptors were executed in porcelain, many of the best thoughts of their architects are expressed in brick, or in the softer (more plastic) material of terra cotta: and, if this were so in Italy, where there is not one city from whose towers we may not descry the blue outline of Alp or Apennine, everlasting quarries of granite or marble, how much more ought it to be so among the fields of England! I believe that the best academy for her architects, for some half century to come, would be the brick-field; for of this they may rest assured, that till they know how to use clay, they will never know how to use marble."

We are disposed to hope that, from one half century to another, our English Architects will continue to regard brick and terra cotta as second to none of the materials at their disposal. So long, indeed, as the climate of England remains unchanged, and the general condition of our cities and towns is subject to the action of existing influences, Brick Architecture—provided it is Architecture—cannot fail both to vindicate its worthiness and to maintain its popularity. But that worthiness requires to be demonstrated before it is reasonable to expect that popularity should be enjoyed.

From whatever especial causes it may have resulted, it is certain that with the alarming discovery of the perishable nature of stone buildings in London a new era in STREET ARCHITECTURE IN BRICK has dawned upon us. Several buildings of decided "architectural pretension" have already been constructed of bricks. Brick Architecture has evidently secured the sympathies of able and thoughtful men. Experiments in brickwork are in the act of being conducted with the most encouraging success, and the new brick edifices are regarded with admiring approval.

Thus a great architectural movement has commenced auspiciously, and it promises to advance steadily and strongly towards a triumphant issue.

In its present condition a valuable impulse may probably be communicated to the progress of this movement by a systematic consideration of the entire subject of brick construction, and of Architecture in Brick properly so called.

Much of the impressive effect of Street Architecture in Brick will always depend upon the skill with which Buildings are designed, upon their architectural character, the proportion and harmony of their component parts, and the actual adjustment of the brickwork. This has been exemplified in a striking manner in the domestic buildings which Mr. Butterfield has grouped with his All Saints' Church in Margaret-street. The brickwork itself may be considered with reference, first, to the nature of the bricks and other plastic materials; secondly, to the disposition and arrangement of these materials; and thirdly, with reference to the introduction of materials of a different character, and their admixture with the bricks, &c.

In a future number we shall resume this subject, and return to it again and again until our readers are presented with a full view of every variety of brick and tile available for either useful or ornamental purposes.

NEW PATENT IN POTTERY.—Messrs. J. C. Coombe and James Wright, of Blackfriars, have taken out a patent for improvements in the manufacture of glass, pottery, porcelain, and other ceramic and plastic wares. This invention consists in the application of fluo-silicates and silicates of alkalies, or alkaline earths, and earthy bases, and precipitated silica, to the manufacture of glass, pottery, porcelain, and other plastic and ceramic wares. The patentees claim more particularly the substitution of the fluo-silicic salts of the alkalies, alkaline earths, and other earthy bases, for the phosphoric compounds of the same or other bases, in the manufacture of glass, pottery, porcelain, and other ceramic and plastic wares.

THE AMERICAN LAKE COPPER.—In 1846 the copper mines of Lake Superior yielded only 160½. worth of copper. Last year they yielded copper worth 600,000½.

DESCRIPTION OF THE ILLUSTRATIONS.

THE WESTMINSTER MEMORIAL COLUMN.

PLATES I. AND II.

AMONGST the public monuments of the metropolis, there are few which are likely to excite more interest, or upon the whole more general approval, than the column designed by the eminent architect, Mr. Scott, and erected to the memory of those who were educated at the Westminster School, but who perished nobly in their country's cause in the Russian and Indian wars. It is pleasing to notice the pride which their old schoolfellows take in doing honour to those who have upheld the glory of old England in many a well-fought field. To most of our readers Westminster School will be only a name; and many may wonder that one institution should not only contribute many noble and heroic soldiers to the public service, but at the same time leave so many of their old schoolfellows behind as to subscribe the large sum required for this public memorial. We propose, therefore, as an introduction to the form, dimensions, &c., of the column, to give a short sketch of the institution that had the honour to send forth so many noble pupils.

Speaking of the Westminster School, Carlisle, who wrote in 1818, says:—"This college, which ranks amongst the first establishments in the British Empire for the instruction of youth, and has produced so many of those distinguished men who illuminated the periods in which they lived as divines and statesmen, as orators, poets, and philosophers, was founded by Queen Elizabeth in the year 1560."

Although the honour of founding this noble institution is accorded to Elizabeth, it is quite certain that there was a school there at a very early date. Ingulphus, in his "History of Croyland Abbey," not only mentions that there was a school at Westminster in the time of Edward III., but says that he himself was educated there. There are also many other notices of the institution; and Elizabeth only carried out the intentions of her royal father, who had done much to prepare the way for her. What she did, however, was to give the institution a definite character, and regulate by act of parliament the manner in which scholars were to be elected upon the foundation of this school, and from thence to colleges in Oxford and Cambridge, as well as the number to be removed annually to the Universities.

Since the time of Charles II. Westminster School has undergone few changes. It is not endowed with lands or other property specially appropriated to its own maintenance, but is attached to the general foundation of the Collegiate Church, so far as relates to the support of forty scholars. It is under the care of the Dean and Chapter of Westminster, conjointly with the Dean of Christ Church, Oxford, and the Master of Trinity College, Cambridge. Most of the boys of the school are boarders. The statutes allow 120 boys—namely, 40 *king's scholars*, and 80 *town boys*. The masters are, however, allowed to take as many town boys as they can obtain, and hence the establishment becomes very extensive.

The boys upon the foundation are denominated king's scholars, and are in a state of collegiate association. They sleep in the dormitory, have their dinner and supper in the hall, and may, if they choose, have breakfast of bread and butter with beer, but as this must be taken at six o'clock in the morning, it is seldom claimed; they are distinguished from the town boys by a gown, cap, and college waistcoat. Thirty-two are provided with gowns once a year, but not with caps. Beyond this, the foundation boys do not seem to have any advantage over those of the town.

The school stands high in the public estimation, and is deservedly ranked amongst the first of our endowed schools. The buildings, although old, are elegant and well adapted to the purpose for which they are employed; and it is only natural that those who have sat at the same desk, or contended in the commodious hall or theatre in honourable rivalry for the chance of promotion in the college, should remember the "schoolboy spot we ne'er forget, though there we are forgot;" should be proud of the distinction which their earliest friends and playmates have won, should love them in life, and honour them in death. It is to this generous feeling that the Westminster Memorial column owes its origin. The design is chaste and elegant, the materials of which it is built of the most durable kind, and the whole work is alike creditable to those whose memory it perpetuates, and those also who in sorrow and admiration undertook and accomplished it.

The column, of which our artist has given an admirable illustration, bears the following inscription:—

TO THE MEMORY OF THOSE EDUCATED AT WESTMINSTER SCHOOL WHO DIED IN THE INDIAN AND RUSSIAN WARS A.D. 1854—1859 ON THE FIELD OF BATTLE OR FROM WOUNDS AND SICKNESS: SOME IN EARLY YOUTH, SOME FULL OF YEARS AND HONOURS, BUT WHO ALIKE GAVE THEIR LIVES FOR THEIR COUNTRY, THIS COLUMN WAS ERECTED BY THEIR OLD SCHOOLFELLOWS IN TOKEN OF SORROW FOR THEIR LOSS, OF PRIDE IN THEIR VALOUR, AND IN FULL ASSURANCE THAT THEIR HEROISM IN LIFE AND DEATH WILL INSPIRE THEIR SUCCESSORS AT WESTMINSTER WITH THE SAME COURAGE AND SELF-DEVOTION.

So runs the inscription, which is engraved in capitals on one of the four panels at the base of the column erected in the *parvis* of Westminster Abbey. In stands within some hundred yards of the ancient seminary where they received their early instruction, and where they imbibed from classic and historic page the sentiments of honour, devotion, and patriotism which ever inspire the true hero and the soldier. The present and future youth of Westminster School may read the inscription, and, whether as soldiers or civilians, resolve when they leave that school, to emulate their predecessors in being ready to serve their country, and, if needful, to sacrifice their lives for it.

On a second panel to the right we read the names of Capt. Augustus Frederick Knyaston, R.N., C.B.; Major Aug. Saltren Willet, 17th Lancers; Capt. Fred. Henry Dymock, 95th Regt.; Lieut. Reginald Hugh Somerville, 23rd Fusiliers; Lieut. Wm. Walker Jordan, 34th Regt.; Lieut. Richard Borough, Rifle Brigade; Midshipman Charles Madan, H.M.S. *Impérieuse*; Frederick Henty, Commissariat Department; and underneath the whole, the words "Russian War, 1854—56."

On a third panel, to the left of the one first quoted, we read the names of General Sir Henry Wm. Barnard, G.C.B., Commander-in-Chief, 1857; Major John Waterfield, 38th B.N.I.; Major Walter R. Prout, 56th B.N.I.; Capt. Wilson Henry Jones, H.M. 13th L.I.; Capt. Louis Henry Bedford, H.M. 37th Regt.; Capt. Wm. Thornton Phillimore, 10th B.N.I.; Lieut. Henry Bingham, H.M. 90th Regt.; Lieut. Lovick Emilius Cooper, H.M. Rifle Brigade; Cornet Wm. George Hawtrey Banks, H.M. 7th Hussars; and underneath the whole the words, "Indian War, 1857—1858." The fourth panel, on the opposite side of the pedestal of the column to the first described, bears the names of F.M. Lord Raglan, G.C.B., Commander-in-Chief, 1854—1855; and Lieut.-Gen. Fred. Markham, C.B. The names of nineteen Westminster scholars who died in the service of their country, are recorded on this monument—names of whom their survivors may well be proud, and justifying the sentence of the memorial inscription, "some in early youth, some full of years and honours," and all that follows.

Of the monument itself, the design of Mr. G. G. Scott, the architect, our engraving will afford an excellent idea. The whole, from its Mediaeval character, is well suited for its site in the face of Westminster Abbey and of Mr. Scott's new houses in Dean's-yard. The figure on the top represents St. George and the Dragon, and was sculptured by Mr. Clayton. The four seated figures represent Henry III., Edward I., Queen Elizabeth, and Queen Victoria. The sculptor of these figures was the contractor for the monument, Mr. J. B. Philip, who also sculptured the ornamental carving. The material of the various portions of Peterhead granite, highly polished, and Portland stone for the rest, except the columns at the angles of the pedestal, which are of grey Aberdeen granite, which give the whole structure an appearance of great strength. The dimensions are as follow:—Total height, 62 feet; height of shaft, 27 feet 6 inches; diameter of shaft, 3 feet 6 inches and 2 feet 11 inches; height of base, 14 feet 3 inches; and width of base, 10 feet.

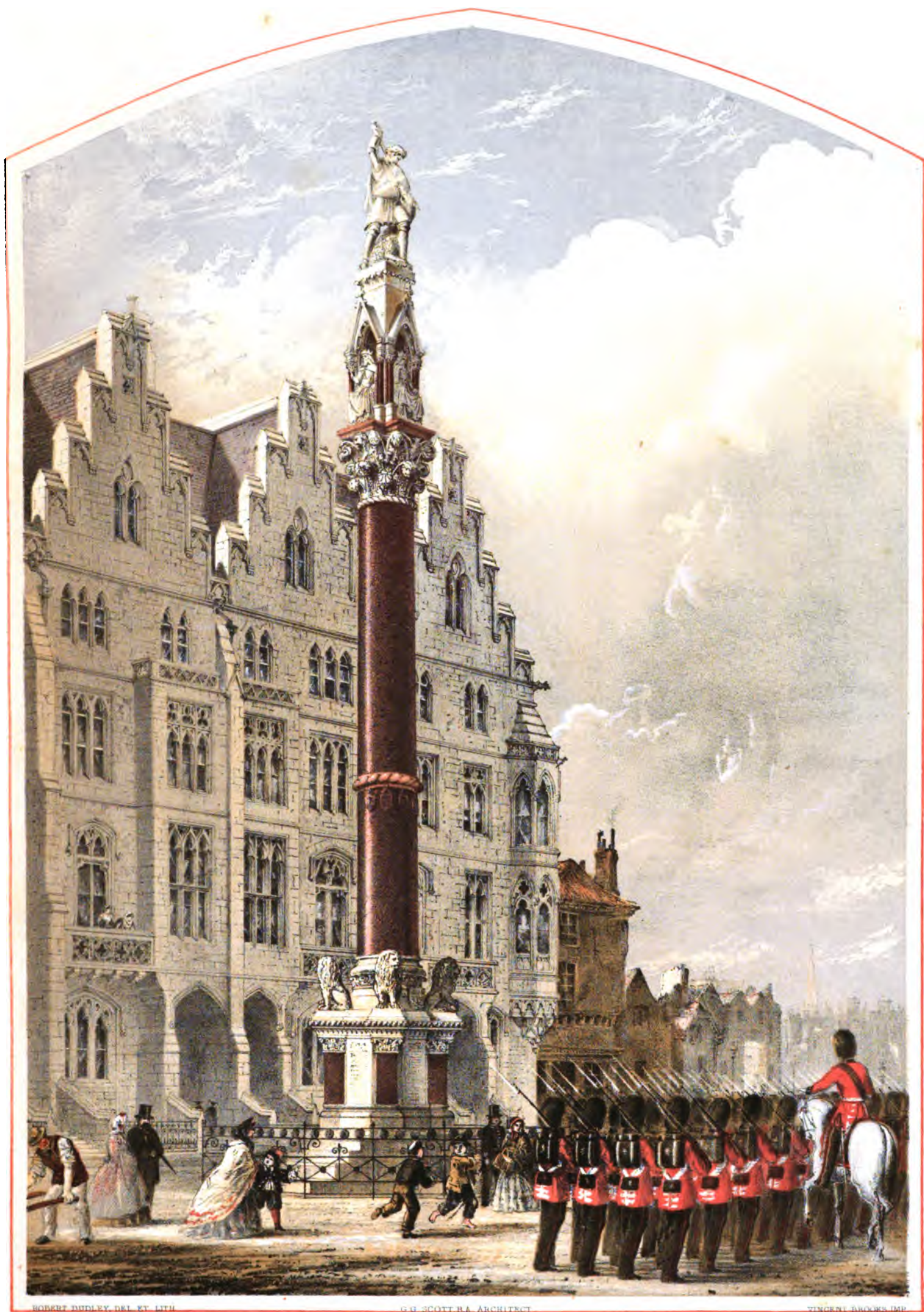
Such is the memorial erected by their old schoolfellows to their friends of early days, "in token of sorrow for their loss, of pride in their valour, and in full assurance that their heroism in life and death will inspire their successors at Westminster with the same courage and self-devotion."

Death is the worst, a fate which all must try,
And for one's country 'tis a bliss to die.
The gallant man though slain in fight he be,
Yet leaves his nation safe, his children free,
Entails a debt on all the grateful state,
His own brave friends shall glory in his fate,
His wife live honoured, all his race succeed,
And late posterity enjoy the deed.

HOUSE AND SHOP, NO. 155, NEW BOND-STREET.

PLATES III. AND IV.

IN our examples of STREET ARCHITECTURE we shall always select those which have some special excellences to recommend them, such as taste, utility, and special adaptation to the purpose for which they were constructed. It is of little consequence to us what material is



ROBERT DUDLEY DEL. ET. LITH.

G. G. SCOTT R.A. ARCHITECT

VINCENT BROOKS IMP.

WESTMINSTER MEMORIAL.

Memorial of the Westminster Scholars to their late Schoolfellows
who died in the Crimean & Indian Wars.



ROBERT DUDLEY, DEL ET LITH

G G SCOTT, R.A. ARCHITECT.

VINCENT BROOKS, IMP

WESTMINSTER MEMORIAL DETAILS.

A CAPITAL OF COLUMN B.C.D. CAPS OF SHAFTS AT BASE E. AT SPRING OF COLUMN FROM BASE

DARTON & HODGE, LONDON



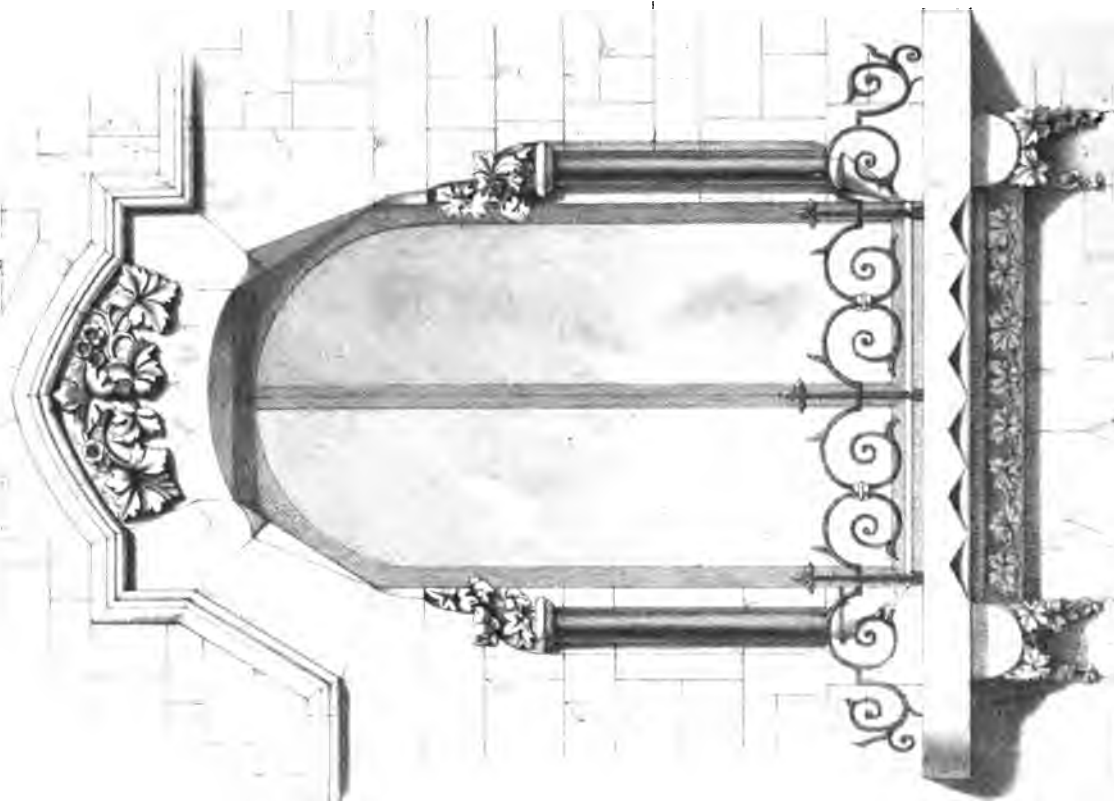
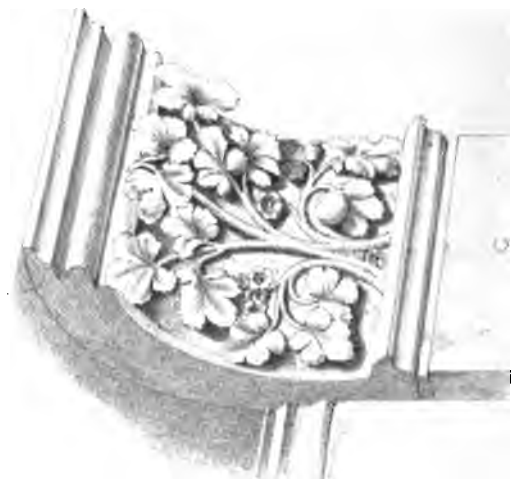
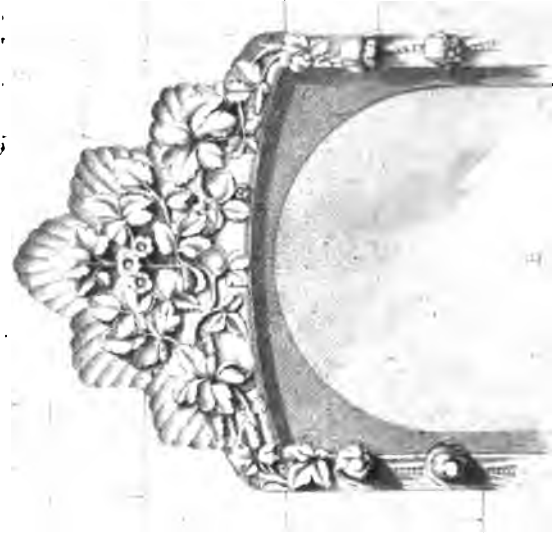
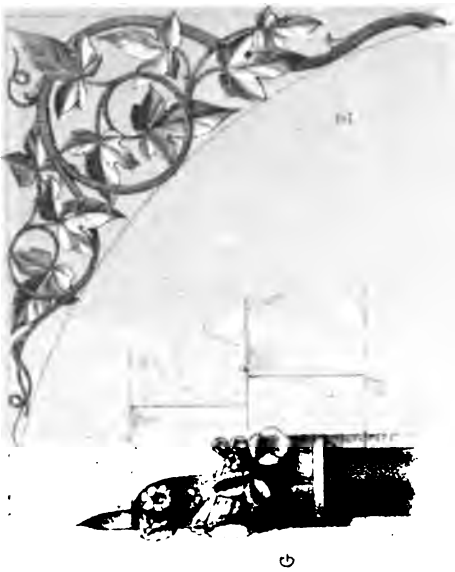
ROBERT DUDLEY, DEL. ET LITH

THOS HARRIS, ARCHITECT

VINCENT BROOKS, IMP

VIEW OF HOUSE & SHOP, NO 155, NEW BOND STREET.

DARTON & HODGE, LONDON



VINCENT BROOKS IMP

THOS HARRIS ARCHT

155, NEW BOND STREET, DETAILS

A WINDOW FROM SHOP FRONT
B WINDOW FROM SHOP FRONT
C WINDOW FROM SHOP FRONT
D WINDOW FROM SHOP FRONT
E WINDOW FROM SHOP FRONT
F WINDOW FROM SHOP FRONT
G WINDOW FROM SHOP FRONT
H WINDOW FROM SHOP FRONT
I WINDOW FROM SHOP FRONT

ROBERT DUDLEY DEL. ET LITH

used, whether brick or stone; we are looking for the display of architectural ability, and provided the conditions of high art are attained, we have nothing further to demand. In this search we shall encounter many disappointments, still we shall also meet with much that will, to say the least of it, approximate towards our standard of excellence, and those examples it will be our duty to present to the public.

In the construction of the house and shop, 155, New Bond-street, the architect, Mr. T. Harris, has made a bold, and we are bound to add successful, effort to produce an original and elegant design, which is at the same time admirably adapted to the purpose for which it was erected—the display of an extensive and magnificent stock of glass and china wares—and the artistic treatment of the whole building. The style is what Mr. Harris calls “THE STONE ORDER OF VICTORIAN ARCHITECTURE.” The character is novel; there is great freedom of expression and originality of treatment; it is attractive without being gaudy, and is chaste, bold, and imposing to the eye, whilst the requirements of trade have been so far consulted that every inch of space has been turned to the best practical purpose. Many of our merchants will, no doubt, be ready enough to invest their capital in this way, if they can always attain the double advantage of beauty and convenience at the same time.

The great difficulty which hampered the architect in the building before us, was the very limited amount of space that he was enabled to occupy, there being only twenty-one feet of frontage. With such a space no room could well be spared for a staircase to the upper floors. This difficulty has, however, been ingeniously overcome by placing the staircase in the centre of the site, between the front and back show-rooms. It is circular, and hence it occupies but little space, and allows a lobby on either side to the back show-rooms. This staircase is, we believe, a new and valuable feature, and one that we should highly recommend where economy of space is required. The main or front portion of the premises is six stories in height, including the basement. The ground floor occupies two show-rooms, 52 feet long, 18 feet wide, and 12 feet high. From the front show-room you ascend by a noble staircase to another of the same dimensions on the first floor. It was desirable to procure an even light throughout for these show-rooms, and for this purpose several admirable contrivances have been adopted; the principal of which are the introduction of two fine windows on the landing, and in the centre of the upper show-room of a skylight so arranged as to soften the other lights by breaking the cross shadows, a thing most desirable in the display of china. Upon the whole, the lighting must be considered as most successful. In the construction of the premises wrought-iron girders have been employed to carry the superincumbent walls of the upper floors, and also the floors of the show-rooms; the whole of the brickwork is executed in cement, and the materials are of the best quality and superior description.

We will now enter upon a description of the artistic character of the building. The street-front is of Bath-stone, with marble introduced. One great peculiarity may be observed in the execution of the stonework, the courses being irregular in size throughout, and so arranged as to subserve and render prominent the main feature, which is greatly assisted by the stones being laid in blue mortar, exhibiting throughout a fine pencil joint. The combination of art and nature in the carving is worthy of study, combining sufficient naturalness to give grace, with artistic treatment to produce harmony of parts. The carving throughout is executed in a most masterly and vigorous manner, and reflects great credit upon the art-workmen. As will be seen by the illustration, the features of the front consist on the ground or street-floor of a double shop-front, with lobby and pair of folding-doors in the centre. The front being enclosed by revolving iron shutters at night, it required study to avoid the blank and unnatural appearance given by this mass of shutter when closed. This object has been achieved by placing four small iron columns at the angle of the sash to support the fascia in front of the shutter-gearing, &c., and connecting them by iron bands forming spandrels, in which are introduced wrought-iron foliage in harmony with the stone carving, but at the same time preserving the metallic character. We would direct especial attention to the wrought-iron work, both for its beauty, freedom of design, and able execution. The fascia consists of serpentine marble slabs, in three compartments, secured to the iron framing, and having the name and business of the firm incised therein and gilded. Under each window is a novel arrangement to avoid those unsightly brass stall-board plates, and which would be well followed: it is the introduction of colour-enamelled brass-plate in panels in the stone, fixed by

ornamental screws, and exhibiting the name, with accompanying colour decoration to sustain the character in harmony with the other parts. On the stone landing covering the shop fascia is an ornamental balcony in wrought-iron, of somewhat more conventional design, on account of close contiguity to the stone carving. The lobby doors and enclosure are of Spanish mahogany of bold proportions, and moulded so as to enhance the beauty of the material; and their effect is certainly good and characteristic. The iron-work is painted in metallic tints, russet and sage-green, relieved in parts by bright red and variation of the tints. A bold pier of stone encloses the front on either side, and effectually breaks off the adjoining houses, and in connexion with the stone under the windows gives an entirety of connexion with the upper part of the house. On the one-pair are three windows, the centre one of bold proportion, with pointed arched head, the side ones with flat segmental heads; a relieving arch flush with and bonded into the stonework above combining the three, and giving satisfaction to the mind with respect to the superincumbent weight. The centre window is enriched by a bold bead with ivy-leaves entwining round, and the head by scallops with oak foliage and fruit. The side-windows are enriched by knots of leaves twining over at intervals from a hollow formed in the splay reveals, combining in the head, which is formed into a shell cut from the solid, into a group of foliage of large size and vigorous design. One window has the blackberry with flower and fruit, the other the columbine with flowers, the arrangement of each being different, although in harmony. We give a separate detail of one of these windows in Plate IV. The sashes are mahogany in oak frames, all polished and fitted each with a sheet of plate-glass. On the second floor we have two windows; the wall-face being recessed, gives a buttress in the centre, which is continued part way up the story, and one on each side carried up to the coping above. These windows may be called the *chef-d'œuvre* of the design. We give an illustration of one of them on a larger scale. They are designed with serpentine marble shafts in the reveals, with carved capitals, the capitals being cleverly arranged without abaci, the carving gracefully running up into the stop-pipe above, and avoiding that unconnected appearance given by the orthodox method. These windows have balconies with circular edges supported on enriched stone corbels, with carved moulding between and wrought-iron ornamental balustrading; the ornamentation of the edge of the stone balcony, as also the carving of corbels, is most successful, and produces a good effect. On the buttress between the windows a little stone-enriched diapering is introduced as a connecting link to the carving. Over the heads of these windows runs a moulded label arching, enclosing in the centre a chaste bit of carving. Between the window-heads, a slab of marble of green serpentine is inserted, exhibiting the date 1862. The label-moulding finishes at each end against the main buttresses with leafage. The windows on the three-pair are two eights, with stop-chamfered reveals and segmental heads, with bead key-stones over the heads; and combined with the arches are introduced lozenge panels of red serpentine marble, exhibiting the monograms of the firm. Over the space between these windows is a parapet supported upon carved corbels and mouldings projecting to the main frontage with notches coping on the top edge of parapet. Over the window spring gables in stone, with a window in each, having pointed arched heads with splayed reveals, &c. The roof is curved and covered with slate, the party-walls visible on each side, and the chimney-stacks are of yellow and white malines with stone introduced. The sashes throughout are of mahogany, and the frames oak, with plate-glass, it being one of the author's theories that in stone order no inferior or artificial material should be employed, but everything as pure and natural as possible.

We will here note that the interior of these rooms is even more *recherché* than the exterior; and the character has been fully carried out in harmony—a thing seldom achieved in the present day; in fact, the structure must be considered as a perfect whole, giving a full embodiment of the author's views, and is perhaps his most successful effort. It must not, however, be overlooked that he has had the assistance of an excellent builder—Mr. Hale, and also of Mr. Allen, the art-workman; and a cursory glance at the building shows that the Messrs. Phillips have not been sparing of their capital. Hence, whatever criticism Mr. Harris's style may receive from his professional brethren, there is not in the same space a more elegant, substantial, and convenient building in the whole metropolis than that which we have the pleasure of presenting this month to our subscribers.

What is before his eyes no one sees. Yet he would pierce the secrets hid in every quarter of the sky.—*Ennius*.

ARCHITECTURE OF PALESTINE FROM THE EARLIEST TIMES TO THE CRUSADES.

BY SIGNOR PIEROTTI,
Architect to the Pasha of Jerusalem.

EVERYTHING pertaining to the Land of Promise will always possess a deep interest for all those whose religious faith has been derived from those who once lived and laboured within its borders. The written records of the lives of its people for many centuries are now well known, for the Bible contains a full picture of the daily life of the Israelites from their first entry into Canaan down almost to their final expulsion from that country. But next to the sacred pages, the monuments which were built by those old dwellers in Palestine must always hold a pre-eminent position; for although the land has been swept by the besom of destruction, and Zion ploughed as a field, still enough remains to tell us what those buildings were which formed its cities and temples, and the monuments which it raised over departed greatness. It is a land of tombs, but every ruin tells its own tale, and brings us nearer to the prophets and heroes of Judea than we should otherwise be.

M. le Conte de Vogüé, of Paris, thus writes, in the introduction to his work upon the Churches of the Holy Land:—"Setting aside the ancient monuments—with which I was sufficiently well acquainted, through my first visit to Jerusalem, of twenty-four days' duration, and with regard to which but little remains to be said—I have occupied myself in the search after monuments of the Middle Ages." This is more than I can say after a residence of eight years in Palestine; and, more particularly, in Jerusalem. I am compelled to own that much still remains for investigation and study in the monuments of antiquity; while those of the Middle Ages are well known; greatly owing, it must be confessed, to the labours of M. de Vogüé, who has rendered true service to science, although he has fallen into the error of ascribing all church architecture to the period of the Crusades. I shall reply to this in due time, and will now proceed to speak of the Jewish works, both before Solomon and during his reign and that of Herod. Thence, I shall come to Constantine, Justinian, and the Saracens, in order to reach the period of the Crusades.

Before the Reign of Solomon.

The condition of the country of Canaan previously to the conquest of Joshua was not that of barbarism. It was certainly, to some extent, a state of civilization. Arts, trade, industry, and commerce were already considerably developed. We are not left ignorant that the country possessed "great and goodly cities," and "houses full of all good things." (Dent. vi. 10, 11.) But how are we to investigate the remains of its edifices? How ascertain their style of architecture? Certainly it is a study not unattended with difficulty. When the chosen people entered the promised land, they had come from Egypt, where art, trade, and luxury flourished. In the wilderness Moses found artists of sufficient ability to construct the tabernacle. It may, therefore, be inferred that they introduced their knowledge into Palestine; but where are the monuments in proof? We well know that the Hebrew people neglected everything else in favour of agriculture, the knowledge of God, and the endeavour to make Him known to others. Such was their indifference to aught else that they did not even possess artisans capable of sharpening their implements of husbandry, of which they always made use in war; and for this they were obliged to have recourse to the Philistines. If they were wanting then in the most necessary handicraft, how was it possible that they should employ themselves in erecting architectural monuments and transmitting them to posterity? We read that David and Solomon were obliged to apply to Hiram, King of Tyre, for artists and labourers to execute their magnificent works. It must be confessed that the want of monuments of this first epoch renders all research into the architecture of ancient Judea exceedingly difficult. The people whose name it bears has not even transmitted to us any historical notices on that subject. I believe that, during the frequent excursions which I made into the country, I came across the remains of walls and arches of that date. The localities in which I discovered them and their construction, I shall place before you, both by means of verbal description and by drawings.

Ephrath.

In the year 1729 before Christ, "Rachel was buried in the way to Ephrath." (Gen. xxxv. 19.) Six hundred and thirty-four years afterwards, Samuel said to Saul, "When thou art departed from me to-day, then thou shalt find two men by Rachel's sepulchre in the border of

Benjamin at Zelzah." (1 Sam. x. 2.) Upon the road leading from Jerusalem to Bethlehem, the monument of Jacob's wife is still to be seen. To the east of this monument, at a distance of 400 feet, a very ancient wall is found. This I believe to have been that of Zelzah. The wall appears to be of Pelasgian construction. It is composed of large blocks of stone, measuring from 3 to 8 cubic feet each. The stones are of the greatest solidity at the base, and diminish in proportion as the vertical rows rise in height. These stones are formed into broad, flat polygons, and united together without cement, but with some degree of precision, by means of small stones employed to fill up the interstices resulting from their irregular conformation. The thickness of the walls at the foundation is 6 feet; above ground, 5 feet: its present length extends to about 208 feet. Above the foundation are five rows of stone of unequal height, averaging from 8 to 9 feet. This relic of the past has been much mutilated by Arab Vandalism, and portions of it used for the formation of fences.

That a city must formerly have existed on this spot is proved by vestiges of other walls; by an aqueduct excavated in the rock and covered with large flat polygonal flags; by the fact that the surrounding soil abounds with hewn stones, with cisterns dug out of the rock, and with ruinous sepulchres which serve as places of shelter for shepherds and their flocks. This wall, of which no author has made particular mention, has some resemblance to the walls of Mantinea, which I visited in Greece, in 1851. I have met with no similar construction in any other part of Palestine.

Deir-el-Benat.

To the south of Bethlehem, and within an hour's distance, lies the valley of Deir-el-Benat, which joins that of Etham, above the Arab village now called Urtas. Upon ascending this valley for about a quarter of an hour, the traveller sees some ancient ruins, which I take to be those of Rath-rabbim of the Song of Solomon vii. 4. An irregularly-shaped space of ground, measuring 52,000 square feet, is surrounded by a wall 5 feet in thickness, and of unequal height, varying from 12 feet to 24 feet. On the east it runs up to the mountain: to the west it faces the torrent. On the latter side is a gate, 8 feet wide and 16 feet high, with jambs formed of several stones, supporting a round-headed arch without the aid of a key-stone, which arch is composed, like the side posts, of stones worked in rustication. The entire wall is built of masses of rock roughly squared, in combination with others of polygonal shape, but all more or less showing traces of rustication. The size of the stones in general is from 2 to 4 cubic feet. The spaces left in the wall are filled up with small stones; and the cement, which is not observable in the exterior, is plainly perceptible in some parts of the interior of the wall. An examination of the cement convinced me that it was applied subsequently to the original construction. Within the space surrounded by this wall I discovered the rock hewn in such a manner as to form different apartments, but no internal construction remains. I, however, collected a number of small cubes of stone, which may be found in a small portion of the ground. They measure three or four lines each in surface, and form a mosaic, though without design. The gate is inclosed by a strong Arab wall. I endeavoured to get it opened; but the Arabs, who foolishly pretend to call themselves the owners of the place, forbade my entrance. Nevertheless, I succeeded, without the aid of baksheesh, in forming an aperture sufficiently large to enable me to see that the gate opened into a vast court, roughly hewn out of the rock; and that from it were two openings leading into other chambers. The walls bear the impress of the ages which they have seen pass away, but are still firmly rooted in their original spot. The same class of wall is found at Lower Beth-Horon. As Solomon erected buildings in that locality, it might be thought by some that these were of his construction; but this is not the case. Such do exist: so that it is easy to compare them, and observe that the one are much more ancient than the other.

The Sepulchral Valley of the Jews at Jerusalem.

In close proximity with the sepulchres of the Jews, on the north, lies a valley which must be traversed to reach Neby Samuil, the ancient Ramah, the dwelling place of the prophet Samuel. A short distance from the valley, eastward, are found portions of a wall, composed of large rectangular stones, roughly put together, without cement, mortice, or iron. Among them exists a doorway, 6 feet wide and 12 feet high, the side-posts of which are each composed of a single stone, and support a monolith architrave, 3 feet high, resting upon them without cement. It bears a resemblance, on a very small scale,

to the door of the Treasury of Atræus, at Mycenæ. Of such constructions no trace is found after the period of Solomon. Throughout the whole of Palestine nothing is to be seen so ancient as those I have just described, and which I believe to be anterior to Solomon.

The works transmitted to us by the patriarchs are necropolises, hewn out of the rock to serve for receptacles for the dead, as at Hebron; monuments erected over graves, like those of Rachel, at Ephratha, and Joseph, at Sichem, formed of simple stones and without inscription; mausoleums, like that of Absalom, at Jerusalem; the level surfaces used as threshing-floors, as at Ramah and Gibeah; and, finally, the vast reservoirs, as on the way to Hebron. In all these works, perseverance and strength to overcome the resistance of the stone are plainly apparent; but the taste and genius of art are totally wanting.

Sepulchre of Samuel, in Ramah.

It will not be out of place here to describe the construction of the Sepulchre of Samuel, in Ramah, which I have minutely examined. In ancient Ramah, now a village called in Arabic Neby Samuil, exists a mosque, which was formerly a church, built by the Crusaders. The walls of this building are far from corresponding with the magnificence of its foundations, formed of enormous blocks of stone, which, though defaced, still show traces of careful and elaborate rustication. On the south-west side of this building stands another of the same period. This contains, or rather covers, the rock in which is the prophet's sepulchre. By a door, formed of iron grating, opened for me by the dervish in charge, I entered a chamber cut in the rock. In the centre of this chamber is an enormous sarcophagus, which I recognised at a glance as a specimen of Moslem architecture, and which is the same that is exhibited with so much pretension and mystery through a hole traversing the entire thickness of the rock, to persons not permitted to set foot upon the rock overlying the tomb of the prophet, but who are obliged to be content with remaining in the upper room, where there is another sarcophagus of wood. This sight did not, however, suffice for me. Upon examining the court, I perceived an opening ten inches in diameter, running through the rock and communicating with a lower chamber, which was utterly dark. Besides that, I saw a passage railed off with iron bars; and inferred, from the rusty state of the gate, that the dervish himself never ventured to visit the old prophet, whom the Mussulmans declare to be still alive. All my endeavours to induce my guide to open this gate were fruitless. Though he persisted in seeking to compel me to retire, I accomplished my investigations, as well as I could, without him. By means of lighted paper thrown down the hole to which I have alluded, I discovered the existence, in the centre of the cavern, of a sarcophagus of whitish stone, of rectangular form at its base, surmounted by a triangular prism, without ornament or inscription. The walls of the sepulchral chamber were smooth, like those of the one in which I was. The smoothness retained the appearance of having been produced by a machine furnished with iron points, and which acted with a rotatory motion. I made the same observation from the horizontal grating, and perceived that the steps were cut in the rock itself. It is under the sarcophagus that the tomb, cut vertically in the rock, must be sought. In my examination I was favoured by fortune, or rather by the humidity of the place itself. Had it not been for this, the lighted paper which I employed would have ignited the petitions addressed to the prophet, and I should have been subjected to the wrath, not only of the custodian, but of the whole village.

From the Period of Solomon to Herod.

During the times of David and Solomon luxury increased among the Jews. The arts and industry greatly improved under the influence of Phœnician artists and craftsmen, who came to Judea in large numbers, and afforded the Hebrews the opportunity of learning their arts. Of the works accomplished by David we have no indications or trace remaining. No doubt can be entertained that he furnished the means and planned the localities, and that his ideas were carried into execution by Solomon. The latter was not occupied, like the former, in fighting against enemies and founding new institutions; and, therefore, was at liberty to devote his wisdom and energy to the augmentation of the splendour of his kingdom by the erection of stupendous buildings, by commercial enterprise, and by the encouragement of luxury little in keeping with the constitution of the country. But of all his great works, what remains have we? The Scriptures inform us: Nebuchadnezzar converted them into a heap of ruins by fire, employed men to raze the walls and fortifications, and carried the people into captivity. In the reign of Cyrus, fifty-two years afterwards and 536 years before

Jesus Christ, the exiles returned to their native land; rebuilt Jerusalem and the Temple of the Lord, which did not equal the first in splendour, in consequence of which Herod substituted for it one far grander. The whole of the long period which elapsed between Solomon and Herod is utterly unproductive of monumental remains. We have certainly not a building, perhaps not even a capital, of the time. Of the latter, however, I speak doubtfully. The capital of the monolith found under the mosque of Aksa is at present the subject of serious study and investigation, with a view to assigning it to the Solomonic or Herodian epoch. In Jerusalem and Palestine in general, we have only blocks of worked stones, walls, reservoirs, and aqueducts of the period in question to discuss; and of these I will now proceed to speak.

The existing walls of Jerusalem, especially on the east, mark the various epochs at which they were built. At their base I recognise the work of Solomon's period; higher up, some portions of the walls as rebuilt after the captivity. Other parts show the refined workmanship of the Herodian age, while Roman and Saracenic work is not rare. The character of the Solomonic walls, as alluded to by Flavius Josephus (book xv. chap. 31, 3), I recognised, on examining the stones forming the foundation of the actual walls of Jerusalem, on the east, on which side I made deep excavations, in order to satisfy myself of the fact. The large stones composing the foundations vary in length, and are squared with some degree of exactitude. They have a smooth border round the rustication, about $2\frac{1}{2}$ inches wide. The rustication itself projects about 3 inches. The stones are joined together by means of mortices cut in the stones, or by cubical clamps of lead and iron, but no sort of cement is apparent. Above the foundation, stones are seen in relief; hence, those portions of the wall in which the courses of vertical and horizontal stones are uniform and well joined, I call Solomonic; but where the construction is irregular, and the external surface of the stones shows the mortices for the tenons, or for the clamp, I assign them to the epoch subsequent to the captivity. At that period the walls were rebuilt in the greatest haste to resist the attacks of an enemy who might appear at any moment, as we find from the Book of Nehemiah. Hence the inequality in their construction, and the laying of the stones face downwards.

The rustication, then, I attribute to Solomon, who undoubtedly employed it in a rough state in the foundations, as is clearly apparent; and also in the building of the towers; and, more finely executed, in the construction of the rest of the wall of the enclosure. The reason why so few remains of external walls of Solomon's time are to be seen may be found in the devastations of fire, Vandalism, successive repairs, and the new conformation given to the stones during the period of Herod and Justinian. This I shall presently point out, and show that Herod himself employed rustication in some parts of his fortifications.

Speaking of the working of the stones of which the Temple was built, Josephus remarks that *they were polished and joined together in such a way that it was impossible to discover the joins*. Of this no vestige remains in Jerusalem. Time, fire, and man have never spared the eternal city, and we are compelled to turn elsewhere for other relics which evidence science and genius.

Solomon's Reservoirs in Etham.

To the south of Bethlehem, and at an hour's distance from it, upon the west side of the road which leads to Hebron, stands a ruined Mediæval castle. This ruin looks as if it stood sentinel over three large reservoirs, which are not only, without doubt, the grandest work existing in Palestine; but are also, indubitably, of high antiquity, and may safely be assigned to the Solomonic era, in accordance with tradition. It is remarkable that neither the Bible nor Josephus directly describes them. The latter, however, in his "Antiquities" (viii., 7, 3), mentions a city called Etham, where was erected the summer palace of Solomon, of which the rabbis give so glowing a description. It is probably this palace which is referred to in Ecclesiastes iii. 4, 5, 6. Of the magnificent grounds nothing remains but some land under excellent cultivation by Mr. Meshullam. This spot, which is situate to the east of the reservoirs, and in the northern continuation of the valley, retains the name of the *enclosed garden* (Can. 4, 12), in honour of Solomon. At various times, among others in May, 1861, Meshullam, in digging the ground for cultivation, has met with the remains of ancient walls, reservoirs, and aqueducts, cut in the rock.

The three great basins are situate in the valley of Etham, which runs down from west to east with a very steep slope. They are fed

by the rain-water that flows down from the two sides of the mountains, and from a fountain situate to the west of the castle, in a direct line to its northern side, at a distance of about 450 feet. I state this because the entrance to the fountain, which is circular in form, is hidden by stones, and difficult to find. Solomon probably alludes to this very fountain in his Song (iv. 12), and it is still called the *Sealed Fountain*. All the three reservoirs are cut out of the solid rock. In some parts they still retain a cement so hard that twenty-nine centuries have been unable to exercise any destructive force upon it. It seems perfectly clear that the primary object of the construction of these reservoirs was the supply of Jerusalem with water, as Mount Moriah is at the present time supplied, in consequence of restorations directed by myself. It is a subject of great regret that the repairs which have several times been executed are never suffered to continue long undisturbed, because the shepherds, Fellahs, or peasants, and Bedouins, continually destroy portions of the conduit, in order to procure the water for their own private wants; and it is difficult in an Arab country to maintain a proper watch over a circuitous line of about 15,000 yards. However solemnly the guardians may promise to fulfil the duties which they undertake, they are easily induced to slumber under the influence of the god Baksheesh.

The first reservoir to the west is 393 feet long: its average breadth is 225 feet, and its average depth 30 feet. The second, distant about 158 feet from the first, is 432 feet long, its width 225 feet, and average depth 42 feet. At a distance from this of 186 feet is the last, 477 feet long, 213 feet in average width, and in average depth 58 feet. All three, unitedly, occupy a square superficies of 179,541 feet, and 12,089,450 cubic feet of the rock from which they are formed. What conqueror or ruler of Palestine could execute so stupendous a work? It must be allowed that the glory of having effected it is due alone to Solomon's genius. But it is not only in the construction of these water-receptacles that hydraulic knowledge and science are apparent. More especially are they displayed in the vast ramifications of the conduits which convey the water from great distances and various quarters; in the formation of various water towers; in the contrivance for filtration; in the manner with which the water is introduced without the least waste; and, finally, in the mode of its conveyance through the conduits to Jerusalem. I am sorry to be prevented by the pressure of time from entering into all these details; but I must not pass over the principal without more special mention. The others may be learned from a paper which it is my intention to print before long.

Let us return to the *Sealed Fountain*, enter it by the opening, and descend a sufficiently incommodious passage for about 14 feet. At the extremity we come to a rectangular chamber, 18 feet long, 10 feet wide, and 20 feet high, whose lateral walls are formed of large Solomonic stones. At the base they are rusticated, and on the upper surface smooth. The vault is a round arch, constructed of large stones, laid in horizontal courses; nor does the keystone show. No cement is used in the construction. In the middle of the western wall is another aperture, which leads to a small cavern where a stream issues out of the rock. At the western corners are two other openings in which springs are seen dripping from the rock. These three fountains deliver themselves into the rectangular chamber, in the middle of which is a reservoir to receive them. In this basin they are filtered previously to passing into the large conduit, which commences at the eastern wall. The conduit is cut in the rock for a great distance; but the upper part, as it approaches the old castle, is covered with large flat slabs. It is 3 feet wide, and $4\frac{1}{2}$ feet high. The waters of this conduit fall a distance of twenty feet at the north-west corner of the upper reservoir, where they are caught in a basin. From thence one part of the water is turned into the first pool, while another portion is conveyed by the aqueduct, which runs parallel with the reservoirs to the point at which the waters of the reservoirs enter the *water tower*, whence they proceed, by the conduit, to Jerusalem.

When the reservoirs are so full that they can receive no more water, to avoid waste the water is received in the basin near the castle, where there is a third aperture leading into a subterranean chamber. Here it unites with the other water, forms a new stream, and all flows together through a subterranean conduit dug in the rock, to supply the *water-tower* from whence the conduit for Jerusalem runs. From the same point proceeds another conduit, which passes southward, at a distance of 600 feet from the third reservoir. This, in case of great abundance of water, could be directed into the valley for irrigation. The whole system of aqueducts has ceased to be of use, because the streams are not abundant; indeed, alone they would be quite inade-

quate to feed such vast receptacles. During the eight years of my stay, it was only once—in 1860—that I saw the three reservoirs full. At other times, it is the second only that has water, and not always that. The whole length of the conduit running to Jerusalem is covered with large stones. In some parts it is constructed of masonry; in others formed in the rock; and, in a few small portions, it consists of terra-cotta tubes, of which I believe it to have been entirely formed originally. I must beg to be excused, on the ground of want of time, if I enter into no further details in connexion with this interesting topic.

Mosque of Abraham, at Hebron.

In Hebron, as every one is aware, is the Cave of Machpelah, purchased by Abraham, and appropriated by him as a sepulchre for himself and his descendants. This cave is surrounded by a wall of the highest antiquity; but the precise date of its origin has not been stated by any writer. I have no hesitation in following the Arab chroniclers of the sixth and seventh centuries, as well as the traditions of the country, and declaring it to be of the Solomonic, and not of the Herodian, age. At the time of Josephus ("Wars of the Jews," book 4, ix. 11), the monuments of the patriarchs, in beautiful marble and of elegant construction, were still seen. Now had they been erected by Herod, the historian would not have omitted to describe them, when he speaks of other important works executed by the same sovereign, since he wrote not very long after the period, and was ever ready to magnify the monumental works of the Hebrews. We may reasonably infer that he does not describe it as Solomon's, because the fact was perfectly well known in his time; as Eusebius and Jerome, for the same reason, are silent about it when they name Abraham's sepulchre. Some have fancifully attributed it to St. Helen, but it would appear that they have overlooked the assertion of Pelgrim, of Bordeaux, who visited Hebron in 333, and describes this surrounding wall as constructed of stones of enormous size. Antoninus, the martyr, in the sixth century, makes like mention of it, but does not say that it was the work of the Byzantine empress.

Epoch of Herod.

Herod struggled all his life long to secure the title of *the Great*; yet he was nothing more than the magnificent slave of the Romans, who allowed him fetters of gold. But from the country and posterity he well deserves the epithet "great," in consideration of the sumptuous monuments erected by him. Little does it matter to us, in our examinations, that they were proofs of his servility or his ambition. Let us proceed to examine them. Some masses of ruins, some trunks of columns, walls, solid foundations, sepulchres built or embellished, and the basements of towers, but no one entire edifice, nor any ornamented one. It is undeniable that Palestine is a sepulchre of edifices, as of individuals.

In Jerusalem we find, belonging to this glorious epoch, some portions of the wall surrounding Moriah, on the eastern and western sides; the entire plan of the construction of the Phazelus; some few remnants of the solid masonry of the Tower of Psephinus; the remains of two others which flank the North Gate; the existing sub-basement of the Damascus Gate, which I discovered in March, 1861; finally, the embellishments added to the sepulchres of the Valley of Jehosaphat, to the north and south. Of all these mention has been made by those who have written upon Jerusalem down to the present time. Little, therefore, remains for me to say; and I will be as brief as possible. I accept the opinion of Mr. Williams that it is the Appic Tower which remains on the west of the Castle of David, and that of Phazelus on the east. The latter preserves the architectural type of a Herodian tower, as described by Josephus (book v. 4, 2). It is based upon the rock, which rises 5 feet above the level of the ground, and is covered with masonry of large rusticated stones. Here I observe that Herod, in his fortifications, made use of the Solomonic level, as I could plainly perceive in Herodium, Cesarea, and other places. The Jewish wall rises 38 feet 6 inches above the side of the fosse. Each course of stones recedes by five lines from the base upwards. I would, however, remark that in the interior it is 11 feet thick, relatively to the upper level of the east trench, which is 14 feet deep, and measures 40 cubits on each side, reckoning the cubit at about 18 inches. It is, then, the same Tower of Phazael described by the historian, who tells us that Titus ("Wars of the Jews," 7, 11) would have it preserved to show the kind of towers that fortified the city which he had taken by his armies. Some may object that Josephus mentions a cistern, and this is not to be found. But would it be possible to preserve it, in accordance with the system of fortification in use in the Middle Ages? I

think not. I meet with nothing in opposition to the idea that the cistern was destroyed in order to gain a clear space of about 20 cubic feet, which would be valuable when soldiers required to be lodged there. It is unnecessary to draw attention to the other towers which flank the Damascus Gate, and which I discovered by means of excavations. With the exception that they are of smaller dimensions, they differ in no respect from those already described. I may, however, say that the gate which I discovered, and which I call the North Gate (Josephus, "Wars of the Jews," 5, 42), is 12 feet wide, and 26 feet high, with a round arch. The stones composing the jambs and the arch are of large dimensions; and this discovery is not so important in an architectural point of view as on account of the ancient city walls of Herod's time. It is one of the most interesting points in support of my opinion, that the walls on the north did not extend beyond the present walls. Not to dwell for ever upon the subject of walls, I will avoid going farther into the matter here; but I will remark that the ancient portions on the eastern side of Moriah, like those at the Jews' Walling-place, appear to me to bear the Herodian character. I am far from adopting the opinion of M. de Saulcy, member of the Institute of France, who believes them to be Solomonic. Their construction shows great perfection, on account of the beauty of the materials employed, the regularity of their arrangement, and the vertical joints which rest upon the middle of the corresponding stones in the lower and upper courses; nothing of which is seen nearly so admirably executed in the walls styled Solomonic. In the latter, artistic genius just developing itself is observable: in the former, genius seems to have attained its full growth.

The Golden Gate, to the east of Moriah, is judged to be Herodian from its ornaments; but I am not of that opinion. I know that the Temple and its walls were destroyed by the Romans; and it seems to me impossible that this gate, with its ornamentation, should have escaped the devastation. Its jambs are formed of stones square and not levelled. They of themselves, therefore, furnish proof of having been morticed in the old wall. The ornamented arches are cased with Roman masonry. How then is it possible to suppose them Herodian? Those who take this view do so because the lintels and architraves of the doors are formed of enormous blocks. It is true that this material is Herodian, and this has led to the erroneous induction. I believe that these blocks are remaining portions of the ancient Eastern Gate; and that to them the more recent construction has been applied, formed upon the same plan as the ancient gate. I think so because the foundation walls have been discovered, and because it is said, in the Mishna, that the Eastern Gate was 40 cubits long and 20 wide, and these are exactly its dimensions.

We will now visit the sepulchres in the neighbourhood of Jerusalem. I unhesitatingly confess that I believe the ornamentation of all of them to be of later date than their original construction, and am of opinion that it was added during the Herodian period. I might maintain that the Sepulchres of the Kings were formed by order of that great sovereign for himself and his descendants; but what proofs have we in support of this idea? I hope M. de Saulcy will not hear me, since he attributes them to the era of the kings of Judah, to which epoch it was necessary that he should trace them, when he was pleased to characterize the sarcophagus taken from them as that of David, in order that he might deposit it in triumph at the Louvre, in Paris. By parity of reasoning, I have met with the sarcophagi of Solomon and Rehoboam, one of which is, in fact, broken into fragments, while the other serves as a receptacle for water in the Hall of Justice at Jerusalem.

Let us now examine some of the sepulchres in detail. That of Absalom is a cubical monolith, measuring 21 feet on each side. Ionic columns support an entablature ornamented with Doric triglyphs and pateras. Above this frieze is an Egyptian cornice, at which point the monolith ceases. The whole of the upper part is in masonry. It is composed of a square dado, surmounted by a cylinder, which is terminated by a torus, representing an enormous twisted cable: the whole is completed by a kind of pyramid of curved conical form, finished with a bouquet of palm-leaves. The total height of the monument is 52 feet. It exhibits, therefore, a mixture of the Greek and Egyptian styles.

Herod was of Idumean origin, it will be remembered. In Idumea are some monuments which recall Absalom's to mind. At the north-west corner of the vestibule, cut in the rock which surrounds the Tomb of Absalom, is a rich pediment, ornamented with acroters and foliage. That of the Jews, to the north of Jerusalem, is of the same description.

To visit the Sepulchres of the Kings a court must be entered by a door excavated in the rock, ornamented by a simple fillet in relief. This is underground up to the commencement of the arch. At the extremity of the court is a vestibule, formerly adorned in the interior with two columns, which have been destroyed, partly by an earthquake, partly by violence. Above the vestibule is a fascia in sculpture. The centre of the fascia is ornamented with a bunch of grapes, now sadly mutilated. On the right and left of this is a triple palm, a wreath of olive-leaves and triglyphs, and alternated with patera three times repeated. Above these is a garland of leaves and fruits, which droops at right angles from each side of the aperture of the vestibule. Above the line of the triglyphs is a cornice in a very ruined condition. Can this ornamentation have been executed at the period of the kings of Judah? I believe not; but, if I err, I am open to conviction. Would that we could find something more satisfactory in Samaria, Cesarea, Antipatris, Herodium, Phazael, and at Castle Cypron; but, excepting some columns, a few ruinous capitals, and immense accumulations of stones, nothing can be discovered of the great Herodian constructions. I therefore turn to a more recent epoch.

Period of Constantine.

When the accession of Constantine the Great to the throne had secured the triumph of the Cross, Palestine witnessed a vast architectural movement, and a number of churches were erected in localities rendered celebrated by the evangelical mission of Our Saviour (and which had been moistened with His blood). From this cause, in the fourth century, Jerusalem attracted the special attention of the Christian monarch and his pious mother; and here was erected a basilica which silver, art, and precious materials combined to render worthy of their piety and magnificence. I will first describe the Basilica of the Resurrection, and then proceed to other monuments, the work of the first Byzantine emperor. It will, I think, be interesting to my hearers if I give some description of the Sepulchre of Christ, over which Constantine erected the Temple. I cannot stop to consider all the objections brought against the authenticity of the tomb, but will merely observe that the tomb exists, and that I have seen it. In the neighbourhood of the city, particularly on the north and east, tombs cut in the rocks may still be seen. Many are in a ruinous condition, others are more perfect. They are composed of two divisions: the vestibule and the sepulchral chamber; the latter closed by means of a stone of elliptic form. The Evangelist St. Matthew (xxvii. 60), describes an occurrence which may be witnessed in the present day in the same locality:—"And Joseph laid the body in his own new tomb, which he had hewn out in the rock; and he rolled a great stone to the door of the sepulchre, and departed."

Christ's sepulchre, as at present existing, is divided into two compartments; the vestibule, in which the guard of soldiers was placed, and the tomb itself, which has a small door of the same construction as those of the Sepulchres of the Kings and of Saint Pelagia on the Mount of Ascension. The religious Greeks, Armenians, and Latins assert that the whole monument of the present sepulchre is rock, beneath the marble facing. I could not discover this, nor do I believe it. Even if it withstood the destruction which befell the city under Titus, and the occurrences of Hadrian's time, we know from history that it was greatly mutilated by Chosroes II. in 614, and by Hakem, caliph of Egypt, in 1010. But I am quite certain, beyond all doubt, that I saw and touched the rock in the pavement, which rises at the distance of 21 feet to the west of the sepulchre and in the sepulchre itself, by the longitudinal cutting which is here exhibited. It is essential to remark that all the sepulchres of antiquity are of the same length and breadth,—the former 6 feet, the latter 2½; and in this respect the sepulchre of Christ forms no exception to others. The disputes would never have arisen if Constantine had not been guilty of the religious Vandalism of separating the sepulchre from the rock on the western side, in order to inclose the sepulchre within the temple, and the further barbarism of adapting the sepulchre to the temple, and not the temple to the sepulchre.

The present Church of the Resurrection retains none of the elements of the grandeur of Constantine. They disappeared when the invasions of the Persians and Saracens covered Palestine with ruins. The successive repairs to which such portions as escaped have since been subjected, have deprived the structure of the characteristics of the fourth century, with the exception of the north wall and the walls and pilasters of the great cupola, which are primitive. The Crusaders, who found the sanctuaries separated, reunited them; and it is their work which is now seen. From their time to the present, no change of importance has taken place. On the 12th October, 1808, a part of the rotunda

and the Calvary, also a portion of the south wall towards the west, were destroyed by fire. The absurd and unintelligent repairs of the Greeks in many points completed the devastations begun by the flames; and numbers of interesting details of Gothic or Byzantine art disappeared, thanks to the degenerate sons of Constantine the Great. The precious marbles which ornamented the Basilica of Constantine were taken by the Mussulmans in the seventh century to adorn their mosques, especially Koubbet-es-Sakharah. Hence, among the ruins recently removed from the eastern side of the sepulchre, shafts of columns have been found, formed of beautiful marble and granite, with capitals in form precisely like the gilded capitals of the mosque. It cannot be supposed, because these precious relics are found there, that the remains of the mosque, which was never destroyed from the period of its erection, had been carried and placed round the sepulchre and in the vicinity of the south. I am, therefore, compelled to conclude that it is not in the Temple of the Resurrection, but elsewhere, that we must seek the elements of the period of Constantine.

Let us now turn to Bethlehem. The Basilica of the Nativity at Bethlehem was begun by St. Helena, and terminated by her son Constantine, between the years 327 and 333 of the Christian era. Some authors have attributed the erection of this monument to Justinian; but a very cursory inspection will suffice to prove that it presents none of the characteristics of the architecture of the sixth century, and that this opinion must consequently be erroneous. It is the oldest and best authenticated monument of Christian art in Palestine. The eye embraces five naves at a single glance. The centre nave is larger than both the two together on either side of it. They are of great length, and formed by four rows of Corinthian monolithic columns, and are composed with eleven intercolumniations. The transept is as wide as the centre nave. The north and south extremities terminate each in a semicircular apse, with a radius of 14 feet. These apses project beyond the exterior walls of the building. On the east, on the side of the transept, separated by a wall formed by the Greeks, the five naves reappear, and form the choir of the church. The centre nave is composed of two intercolumniations and a semicircular apse, equal with those which terminate the transepts. The two which succeed, right and left, are terminated by a straight wall, which commences at the choir. Owing to this arrangement of the lower sides of the basilica, the upper portion of the cross is symmetrical in relation to its lateral arms. The width of the great centre nave is 30 feet; the first lateral nave, 12 feet; the second, 10 feet; so that the total width of the five naves is 74 feet, while the entire length of the centre nave is 180 feet.

The monolithic columns forming the divisions of the naves are 17 feet 3 lines in height: their capitals are Corinthian; that is to say, the proportions only slightly differ from the proportions demanded by the rules generally observed in the time of the Roman empire. In fact, the column is short relatively to the diameter of the base, which measures 2 feet 6 lines. Besides this, it presents no very distinctive characteristics, but shows signs of the decadence, reposing as it does upon a plinth which measures 3 feet 2 lines on each side. This want of proportion has been supposed by some to have been owing to the inability of the calcareous bed from which the columns were derived to produce monoliths of greater height; but as the quarries still exist, and I have carefully examined them, I cannot admit the explanation; but rather opine that it is simply the result of the decadence of art. As I have already stated, the diameter of the base of the column is 2 feet 6 lines; the height of the shaft, comprising the base and capital, is 17 feet 3 lines; and, consequently, the latter is short in proportion to the former. Further, the base has no very decided character. It rests upon a rectangular plinth, measuring 3 feet 2 lines on each side. I may further add, that the total number of entire columns is forty-six, of half columns eighteen, and that the latter are inserted in the pilasters on the wall, where the rows of columns terminate. In the abacus, all these are ornamented with crosses in relief. In the lateral naves (side aisles?) architraves support the [framing of the] roof. In the central naves the walls, which are 30 feet high, are also supported by the architraves on which rests the great *armatura* of the roof. The roof is not vaulted, but composed entirely of wood. In the upper part the walls contain circular-headed windows corresponding with each space between the lower columns. The spaces between the windows, and all the rest of the surface of the walls, in the twelfth century, were ornamented with mosaic work. The present roof dates from the seventeenth century, and the Greeks alone claim the right to repair it. I conclude, then, this is the only complete work of Constantine which remains to us after the lapse of 1529 years. This alone has survived every destructive influence, and maintained its ancient characteristics.

It is a very striking specimen of Roman genius. The venerable aspect of the edifice, the harmony of its combinations, and its original conception, all arouse admiration. It is indisputable that the general plan of the church produces an impression of beauty, not only from its dimensions and the simplicity of its outlines, but because it is the embodiment of an intelligent phase of religious architecture, and thus cannot fail to satisfy the taste and please the eye.

Other remains of the period of Constantine and of his mother Helena are met with in many parts of Palestine, but they consist simply of walls, heaps of stones, shafts of columns, and mutilated capitals. I shall, therefore, pass them over without special mention. The buildings erected subsequently to Constantine are mere cemeteries of stones, mutilated by Mussulman fanaticism.

Epoch of Justinian.

The Emperor Justinian, no less ardent than his predecessors in erecting religious edifices, did not forget the Holy Land, but there raised a great number of such structures. All, however, which remain standing as mementoes of him are the Basilica of Saint Mary, at Jerusalem, now converted into the Mosque El-Aksa; the tower called Justinian's, at Bethlehem; and the ruins of the Church of St. George, at Lydda, the ancient Diospolis. In other parts of Palestine, other religious monuments were erected by this emperor, but their localities are only indicated by heaps of ruins. The details have vanished, either from the effects of fire or violence, chiefly through Mohammedan fanaticism. The Aksa shows its Christian origin, and Procopius has left us a detailed account of its construction (De A. Edif. Justin. 5, 6). It has in front of it a portico with a vaulted roof, corresponding with the seven naves of the church. The central arch is much larger than those on either side. The exterior and interior present very pointed arches. The whole building exhibits the well-known plan of a primitive Christian basilica. The centre nave is supported by six large columns of *breccia rossa* of Palestine, with ordinary Corinthian capitals, somewhat disfigured by incongruous details and ornament. These columns support pointed arches, above which are two rows of windows. The first two lateral naves are supported by square piers: the other four are much lower, of a totally different construction, and appear to have been added at a much later date. In this particular, I fully agree with the Rev. Geo. Williams in his "Holy City," that the mosque was enlarged on the east and west sides by El-Makdi, in 775, 785.

The Tower of Justinian, at Bethlehem, built for the defence of the Temple of the Nativity, merits some notice. It is square, and measures 97 feet on each side: its height is 122 feet. The walls, which are 22 feet thick, are solid, and built with large blocks, which diminish with each course of stone. The Greeks, who are the possessors of the tower, in the thickness of the walls have made several chambers, which are used for the reception of pilgrims. The largest of these chambers is capable of containing forty persons. I have mentioned this edifice to show that a complete work of Justinian's era exists at Bethlehem, and that as far as masonry is concerned, it will bear comparison with that employed by Constantine in the Basilica of the Nativity. In the latter, the good Roman style is seen; in the tower, the decadence. The Church of Saint George, at Lydda, the ancient Diospolis, was erected by Justinian. Of this splendid edifice nothing at present remains but a portion of the walls and the eastern choir, with some magnificent pilasters and capitals. On the south side is a large pointed arch, supported by large columns, mortised in the piers, and surmounted by Corinthian capitals. A great part of the church still remaining has been converted into a mosque by the Mussulmans. The design which I exhibit will show the date of this monument better than any description.

Epoch of the Arabs.

I do not think it necessary to translate the description of the Mosque of Omar, seeing that it has already been translated for the Mount Moriah. The whole platform is formed of the rock, which is clearly seen on going into the dwellings of the Dervishes and the guardians; as well as in some oratories and in the cisterns, especially the two on the north of the Great Mosque.

Koubbet-es-Sakharah,—the Dome of the Rock.

Its plan is simple: two concentric octagonal aisles surround the circular central part, which supports a Pointed dome. The form of the dome serves alone to characterize the building. The many descriptions given of its interior prevent me from repeating it; and I shall only remark that its doorways and windows are of Pointed style;

that the sixteen columns standing in the inner octagon aisles are of equal height, and have the same capitals, but rest on unequal bases which exhibit very much the characteristics of the period of decadence to which the building belongs; that the twelve columns, which are to be found between the four piers supporting the tympanum of the dome, have a diameter different from the sixteen first met with, as well as different proportions of shaft, capital, and base; and that all these columns support arches slightly pointed. The vaulting of the dome is of wood, covered with Arabic gilding. The tympanum and spandrels of the arches are inlaid with elegant mosaics, which date from the time of the sultan Selim I. All this induces me to believe, according to history, that the mosque was erected by Abdel-Melik Merwan, in the year 68 of the Hegira, and that its columns of precious marbles, and various origin, have been taken by the Mussulmans from the Basilica erected by Constantine over the Sepulchre of Jesus Christ. Constantine alone is well known to have enriched the religious edifices of the Christians with marbles; and history reproduces but too many examples of the spoliation of these buildings by the Mussulmans to decorate their mosques.

THOUGHTS ON THE FUTURE OF ARCHITECTURE.

THERE is no phrase more frequently in use amongst all classes of society, than that we live in an age of transition and progress. It is a truth which is more applicable perhaps to architecture than any other of the arts, although we frequently hear the reproach that there is nothing original to be seen. Surely this reproach is unmerited, and even a casual survey of the contents of the Architectural Gallery at the International Exhibition cannot fail to impress the mind with a sense of the great amount of original and varied treatment to be found in the designs exhibited there. We must not be impatient, nor expect overmuch; indeed, the more slowly developments of new styles or changes of old ones proceed, the more reliance may we place on the final result. Working in stone, iron, and wood, is a serious business, involving such expense that employers, even those most disposed to accept or promote something out of the beaten track, may fairly be excused for pausing before they commit themselves to untried effects. Therefore it is that the architecture of the nineteenth century, even allowing for the rapid changes and advance of all the sciences at the present day, cannot be expected to reach its full development in our time, but the future of that style, the Victorian style, as it is already named, is assured, and requires only time and opportunity, we believe, to be carried out to a most successful issue. The best artists in the architectural profession are not to be found in the ranks of those who are bigoted to any peculiar style. Catholicism in its true sense—that of universality—is thoroughly opposed to the narrow and obstructive prejudices of those unprofessional writers, who evince more mastery of language and power of vituperation than knowledge of the subject on which they would fain be considered Sir Oracles, whilst the architects who practise what those writers preach form but a small minority—the “*Dii minores*” of their own cliques. These do well enough for their day and their purpose; but over and beyond these, the great spirit of modern life, demanding constant and progressive change, sweeps with electric power, infusing into all men's minds one pervading and grand idea, that of individual and original development. With all due deference to the works of our predecessors, with all just admiration for the styles of the past, our present object, the object of all the professional leaders of our day, should be to consolidate and systematize the knowledge we are now in possession of, and from the lessons thus obtained, and the examples thus given, to strike out a new path for the powers of the architect as artist, and to bring back the art itself to its normal state, which is one of gradual but sure progression, founded on increasing scientific and artistic knowledge. We hold this final result as inevitable. There are many styles of architecture yet to be originated or developed in the world. What has happened in the past will be reacted in the future. There is no analogy in history that could justify us in believing that this or that style of art having once budded, flowered, and withered away, can relive its former life; it may be reproduced, imitated, rehabilitated, but the spirit of true life is wanting, for it in no way represents the great artistic tendencies of the age.

For different effects and different purposes, we require different styles: the cloistered, chapel-indented, dim-lighted, lengthy cathedral of the mediæval Papal church can be of no service to the auditory of a Pro-

testant clergyman, and thus our fine old cathedrals are ruined by an enclosure where the requirements of our service may be sensibly enacted. We have no hesitation in affirming that in no branch of architecture is greater reformation necessary than in the buildings dedicated to the use of the Reformed church. Architecture we cannot call it. There is no fact more strange, yet more true, than that the great revolution of religious thought and practice in the sixteenth century produced no corresponding change in the buildings required by the proselytes of the new church. They simply seem to have demolished all that bore upon matters of creed, and having tumbled shrine, rood-loft, and image out of doors, quietly sat down to hear the reformed doctrine as best they might between bare walls, in unaccommodating aisles. The introduction of the Italian style produced no change of system, and the same interior, as much broken up with columns as possible, so as to prevent people from hearing or seeing conveniently, continued in vogue, even up to this day, with the exception of the places of worship built by Dissenters. This senseless and utterly unsuitable arrangement for a Protestant congregation holds sway. We trust that our ecclesiastical architects do not delude themselves with the idea that such a columnar arrangement is indispensable to the requirements of the style they practise, for they may learn a valuable lesson to the contrary, by visiting some of the mediæval churches of the South of France, especially those of the lower town at Carcassonne; but these are not the only anomalies in our modern system of ecclesiastical architecture, which lead us to believe in its merely temporary existence as a fashion, and the exponent of a transitory religious sentimentalism.

The tower in old times served not only as a place of refuge and defence, but as a depository for those bells which not only called the faithful far and wide to worship, but scared with their sacred sound all demons and evil spirits from the holy precincts; this was most seriously believed in, and to effect such a very desirable result, we would put up with a good deal, but no such pretext would be brought forward at this day for a noisy peal of bells, and in this age of clocks and watches, there is really no excuse for thus annoying all who are unfortunate enough to live near a church. The spire, moreover, then rose not only beacon-like, but *bond fide* a beacon to the neighbourhood and to wayfarers, but such a purpose in our cities is out of the question, and it must be admitted that these very picturesque adjuncts to the modern mediæval church are merely placed there at great expense to please a sentiment, and not to satisfy a want.

One of the great requirements of the day is to cover large areas, at the most moderate cost, and probably for a temporary purpose only. This problem has been satisfactorily solved in the numerous magnificent railway stations of Europe, amongst which that of Munich, for originality of design, beauty of proportion and decoration, stands, we think, pre-eminent. The applicability of this principle, combined with the plan of a conservatory, led, some ten years since, to the design of our own Crystal Palace, when a new style of Architecture, as remarkable as any of its predecessors, may be considered to have been inaugurated. We consider that iron and glass in conjunction have succeeded in giving a distinct and marked character to the future practice of architecture.

Sydenham was a great step forward, and the building at South Kensington, in the hands of any architect of knowledge and taste, would no doubt have shown a still greater advance. Unfortunately, a genius for producing downright ugliness in place of beauty has presided there, and though a great principle is carried out—namely, the combination of brickwork with iron and glass—yet the result is retrograde rather than progressive, as regards the development of our new resources; but other examples are not wanting to show the valuable results we may expect from the future. The Cattle Market at Islington, the Exhibition building and new markets at Paris, and the new market at Poitiers, point out what admirable results may yet be looked forward to.

Moreover, it is not only in the development of these novel resources placed at our disposal, but in the dealing with old-established styles, that we perceive evident tendencies to improvement, or at least change. Puginism is already out of date. The most popular of our rising architects in the mediæval style, are those who evince most boldness in deviating from ancient models. Every phase of the style has been taken up, and seems to have been set aside as unsatisfactory. Late Tudor was first in the field, but speedily gave way to the better proportions and ornament of the Decorated period. We are now going back further still. There is no abiding resting-place to be found for the aspiring mediævalist; everything now must be very early and pure pointed; there was no real art, it is now confessed, out of this, the

truly classic period of the style; but we who have marked the changes in this school, smile as the enthusiastic admirer vows eternal admiration to the present object of his love, and treats with scorn the degraded idols of his professional brethren not half a century since.

How long will this devotion to the Early Pointed style last? Satiety will come at last, and the next fashion, we doubt not, will be of Romanesque or Byzantine character; the auburn, not to say red-haired maidens of the North, with their sentimental blue eyes, being displaced by the raven hair and languishing dark orbs of the daughters of the South and the East.

If we turn to the latest development of the Renaissance style, we also perceive great change. It is not the Renaissance of France, the "Quattro Cento" of Italy, or the Plateresque of Spain. There is an evident straining after originality, and sometimes with very good effect. Look where we will, there is no slavish imitation of any former style: each one in his way endeavours to give an individual character to the style he takes up; and even Italian, that Italian style so severely hemmed in, "cribbed, cabined, and confined" by the rules of Palladios, Vignolas, and Chamberses, looking to the glorious example set by Wren, may hope for a development suited to the requirements and tastes of the day. But we do not wish to peer presumptuously into the future. Styles still unthought of, yet to be, will, we doubt not, arise and progress in slow and stately course through centuries to come, as they have already done in centuries past. Enough for us, if we can perceive, and accept as fraught with earnest of future advancement, the changes, developments, and individual character of the works of the age in which we live, and hail as full of promise the numerous designs transformed into bodily shape throughout the United Kingdom during the reign of Victoria. Δ

ARCHITECTURAL ORNAMENT.

WHAT is the place for ornament? Consider first that the characters of natural objects which the architect can represent are few and abstract. The greater part of those delights by which nature recommends herself to man at all times, cannot be conveyed by him into his imitative work. He cannot make his grass green and cool and good to rest upon, which in nature is its chief use to man; nor can he make his flowers tender and full of colour and of scent, which in nature are the chief powers of giving joy. Those qualities which alone he can secure are certain severe characters of form, such as men only see in nature on deliberate examination, and by the full and set appliance of sight and thought; a man must lie down on the bank of grass on his own breast, and set himself to watch and penetrate the entwining of it, before he finds that which is good to be gathered by the architect. So, then, while nature is at all times pleasant to us, and while the sight and sense of her work may mingle happily with all our thoughts and labours and times of existence, that image of her which the architect carries away represents what we can only perceive in her by direct intellectual exertion of a similar kind in order to understand it and feel it. It is the written or sealed impression of the thing sought out; it is the shaped result of inquiry and bodily expression of thought.

Let us consider for an instant what would be the effect of continually repeating an expression of a beautiful thought to any other of the senses at times when the mind could not address that sense to the understanding of it. Suppose that in time of serious occupation, of stern business, a companion should repeat in our ears continually some favourite passage of poetry; over and over again all day long. We should not only soon be utterly sick and weary of the sound of it, but that sound would at the end of the day have so sunk into the habit of the ear, that the entire meaning of the passage would be dead to us, and it would ever thenceforth require some effort to fix and recover it. The music of it would not meanwhile have aided the business in hand, while its own delightfulness would thenceforward be in a measure destroyed. It is the same with every other form of definite thought. If you violently present its expression to the senses at times when the mind is otherwise engaged, that expression will be ineffective at the time, and will have its sharpness and clearness destroyed for ever. Much more if you present it to the mind at times when it is painfully affected or disturbed, or if you associate the expression of pleasant thought with incongruous circumstances, you will affect that expression thenceforward with a painful colour for ever.

Apply this to expressions of thought received by the eye. Remember that the eye is at your mercy more than the ear. "The eye it

cannot choose but see." Its nerve is not so easily numbed as that of the ear, and it is often busied in tracing and watching forms when the ear is at rest. Now if you present lovely forms to it when it cannot call the mind to help it in its work, and among objects of vulgar use and unhappy position, you will neither please the eye nor elevate the vulgar object. But you will fill and weary the eye with the beautiful form, and you will infect that form itself with the vulgarity of the thing to which you have violently attached it. It will never be of much use to you any more; you have killed or defiled it; its freshness and purity are gone. You have to pass it through the fire of much thought before you will cleanse it, and warm it with much love before it will revive.

RUSKIN.

THE ORIGIN OF THE ARCH.

BY SIR J. J. WILKINSON.

THE origin of the arch may be ascribed to the scarcity of wood fit for rafters; and the want of timber trees in Egypt, together with the habit of building with crude bricks, taxed the ingenuity of man to devise a method of constructing roofs with the same material as the walls. Similar instances of the influence of materials are not uncommon. The peculiar fracture of certain kinds of stone led to polygonal masonry, and the groined arches of Gothic churches, the round towers of brick or of flint, and other peculiarities of construction, have been indebted to materials for their principle and form. Bricks, therefore, being called upon to complete the whole chamber, suggested the vaulted roof; and the size of some Egyptian bricks, nearly one foot and a half long, eight inches broad, and five and a half inches thick, was a saving of labour to the construction. And in order to spare as much of the arch as possible, they were placed lengthways; the ends of the bricks being cut into a wedge shape, or the space left between their upper edges being filled in by a triangular piece of stone imbedded in the mud that served for mortar. Either of these methods made up for the curve of the arch, and enabled the bricks to radiate to a common centre, on which, and not on the keystone, the principle of an arch depends, for many arches, both round and pointed, have been built in modern ages without a keystone.

They afterwards improved upon their mode of placing the bricks, and arranged them side by side, as in modern buildings; and some of the double concentric arches over the gateways before the Tomb of Thebes are as beautifully constructed as those of Roman or of modern times. They are of the age of Psammetichus and the other kings of the twenty-sixth dynasty, about 600 before our era. But many well-built arches were made on the old principle to a late time, and consisted of three or four concentric rows of bricks placed lengthways, with a sort of hood or tripetone projecting beyond the level of the wall and the face of the archbolt.

The oldest stone arches hitherto found in Egypt are of the same date, or about 600 B.C.; all those of earlier times being false arches cut in the thickness of the overlapping stones—a mode of construction common also in Italy and other countries at a remote age. When they first began to use stone for real arches is uncertain, but it was evidently brick that first led to the invention. And it is a curious fact, that those stone arches at the pyramids of Gebel Bérkel, in Ethiopia, imitate the old system, the blocks being placed lengthways, like the bricks of the earliest Egyptian vaults.

To bricks, indeed, various styles of building were indebted for their origin; they exerted very great influence on massy kinds of architecture, and they were the earliest improvement on that primitive mode of construction—the mud wall.

The Egyptians seem at first to be afraid of roofing large spaces with the arch, and their vaulted tombs are seldom more than seven or ten feet in breadth, until the time of the twenty-sixth dynasty.

The same remark applies to the early pointed arches built by the Christians in Egypt, dating about the seventh century, which are seldom more than two and a half feet in span. They were only used for covering narrow spaces, as staircases or niches, and were formed of bricks placed lengthways, as in the earliest round arches. The two uppermost bricks usually met together in the centre, the key being formed of a triangular piece of stone or brick; and a still ruder kind of arch consisted of three bricks, with the centre one placed horizontally between the other two.

But the pointed arch was not devised *in order* to cover small spaces, nor (as some have thought) because there was not room enough for placing a small round one on the same level with those of larger span,

as this difficulty is more readily removed by the stilted round arch than by inventing a new one. Much less did it originate in the intersection of two round Norman arches, or in groined vaults, both which were unknown till long after the pointed arch had been commonly used in the East. A whole mosque still remains at Cairo, built by Sultan Ahmed-ben-Tooloon, A.D. 879. The eufic inscriptions on the Nilometer of Roda, opposite old Cairo, show from their style that its pointed arches are of a similarly remote period; and there is reason to believe that this kind of arch was used by the Arabs long before. It is also found covering one of the chambers before an Ethiopian pyramid of Gebel Bérkel, built while the Romans were in Egypt. There is one of the keystones over a passage at Tusculum at least as old as the days of the Latin confederation; another at Pompeii, and at Zindan, and at Ephesus; and future discoverers will doubtless prove that it was employed in the East and used by the Saracens.

The arch seems to have been considered by the Egyptians particularly appropriate for the tomb; even the ceilings of many hewn in the rock were cut in imitation of it, as at Beni Hassen; and some of the oldest sepulchral chambers in the Great Pyramid had that peculiar mode of construction, which was the precursor of the arch in Egypt and other countries—a pointed or pent roof, formed by two sets of stones inclined towards each other.

THE ARCHITECTURAL EXHIBITION.

By G. R. BURNELL, Esq.

THERE must be something anomalous in the position which architecture holds in public estimation, when a large number of the followers of that art feel themselves so badly treated at the ordinary exhibitions of the season, as to render it advisable for them to organize an exhibition of their own. It is indeed a fact, at the present day, in our country at least, that architecture—literally the chief art—which in former times directed and controlled the employment of the other arts, is now hardly regarded as one of them, but rather as a species of trade but little removed from the ranks of a handicraft. It is true, that in the Royal Academy there are some members connected with architecture; and that a species of recognition of its claims to rank amongst the fine arts may be discovered in the existence of the professors' chairs for the purpose of instruction in its principles. But this seems only to be a "lip homage;" and, certainly, in the annual exhibitions a small space is awarded to the architectural drawings, and less attention is paid to them, either by artists or by the public, than is paid even to the unrecognised productions of engravers. Painting and sculpture, formerly the handmaids of architecture, have in fact dethroned their former ruler, and they occupy the space in public estimation which was formerly conceded to the principles of construction. The explanation of this phenomenon is not easy, or at least it cannot be given in a few words, and therefore it may be passed over for the present; but the subject is one which architects would do wisely to reflect upon, in order to discover the means of raising their profession from its present depressed state to the rank it is justly entitled to hold. In the meantime, the existence of a distinct architectural exhibition seems to us to indicate the perception by the body of architects of the necessity for some decided action on their part to reassert their claims to a due recognition of their position as artists; the manner in which they have attempted the execution of the desired object is, however, unfortunately very inferior to the magnitude, or the importance, of the design they seem to have conceived.

For in the back rooms of the basement of a second-rate house in a second-rate street are huddled together the designs, studies, and sketches of the men who are supposed to represent the architectural taste of the day; and the "premiated" (as the neologists persist in calling the "prize") designs of recent public competitions, and of the competitors for the Institute medals or other rewards, are grouped together with an incongruous mixture of clerical robes, church furniture, building materials, and engineering models. Alas! if the directors of this exhibition may be taken as exponents of the intellectual power or of the organizing capacity of the leaders of the architectural profession in England, there can be little reason to be surprised at the position they hold in the public estimation; for it would be difficult to imagine a more unsatisfactory or a more incomplete representation of the state of art than is here to be found. And the objection applies nearly as much to the quality of the designs, as it does to the manner of their arrangement; to the equivocal direction of the taste of the present school of architecture, as much as to the want of some sound comprehensive principle amongst

those who are supposed to influence its development. It is not enough to provide wall-space in an exhibition to assist architects in regaining their proper position in public estimation; but it is necessary to guide and instruct, to raise the tone of artistic feeling, to correct false doctrines, to encourage originality whilst inculcating a love of study, and a respect for the traditional teachings of those great masters "who being dead yet speak." Nothing of this seems to have been done by the managers of the present show; and it therefore is a mere lifeless, aimless assemblage of objects utterly without influence upon the future progress of the art. Strangely enough, too, the tendencies of an exclusive sect amongst architectural professors appear to have been paramount in the selection of the objects exposed on the walls of the Conduit-street basement; and it seems that one remarkable form of architecture meets with but little favour from the men who, putting themselves forward as encouragers of art, should encourage the most catholic treatment of its manifestation. In fact, neither the manner in which this exhibition is arranged, nor the principles on which it has been conducted, seem to us to be of a nature to advance the true interests of architects or of architecture. It will be necessary to return to this subject—viz., that of the best means of advancing the study of architecture—hereafter; at present, attention will be principally directed to the objects which are to be met with in the Exhibition.

In the first place we may remark that notwithstanding our previous observations, one cheering sign of the times is to be found in the marked improvement perceptible in the style of drawing prevalent amongst the younger members of the profession, for there are amongst both the water-colour and the pen-and-ink drawings many works of remarkable merit, solely on the score of the excellence of their mechanical execution. This earnest, conscientious attention to the working details of their profession, must have an influence upon the modes of thought of our rising artists, for no man of intelligence can dwell long upon a single subject without fixing his whole soul upon it, and moreover it is to be observed that the architects who have produced the most remarkable works of modern times, have also been the best draughtsmen of their day. Indeed, the architect has more need of a profound knowledge of the laws of chiaro-oscuro, of harmony of colour, and of perspective effects, than the professors of the other arts of design, because it is his duty to prepare his works for their subsequent operations, whereas the other artists have but to appropriate the results of his studies. No really good architecture can be designed without a study of its optical effects, both with regard to those connected with perspective and skiagraphy; and much of the tameness of the works of the last generation may be attributed to the neglect of the pictorial treatment of the designs which then prevailed. The elevations, some "sixty years since," were only drawn geometrically (mostly in outline), and when attempts at shading were introduced, they were executed in Indian-ink; under such circumstances it cannot be a matter of surprise that the buildings erected from them were cold and destitute of movement; and for these reasons the attention paid by the body of architects at the present day to mere drawing, must be hailed as one of the healthy indications of the spirit abroad.

Amongst the drawings themselves, attention may be called to Nos. 7 and 8, by Mr. E. W. Godwin, of the designs for the Hull and the Northampton Town-halls, the latter of which was selected by the municipality of that town in opposition to the recommendation of the professional referee, who gave the preference to No. 185, by Mr. L. de Ville. Mr. Godwin, however, seems to have a decided affection for canopies and figures, whose only use is to fritter the surfaces of his elevations, and to be fond of introducing towers of doubtful utility and inelegant outlines; but there is the true romantic feeling about his compositions, and a keen perception of pictorial effect in his treatment of detail. The design for the Godolphin School, Hammersmith (15), has merit, though defective in some respects; but the drawing No. 20, by Mr. Whichcord, requires rather more extended notice, precisely on account of its defects, emanating as they do from so distinguished an artist. Mr. Whichcord has designed the offices here represented upon the principles Mr. Fergusson supposes to guide the first attempts to combine construction and artistic treatment, for the composition consists, in fact, of a series of vertical piers, supporting horizontal bands, and crowned by semicircular arches. Now, this arrangement produces a very disagreeable effect; for in the first place the great height of the piers destroys every idea of proportion; then the horizontal bands (in a town where brickwork is almost exclusively used) suggest the idea of false construction; and lastly, the introduction of the arches at the top looks very much like unsafe construction, for the arches, in fact, have always an outward thrust, which would tend to overthrow

the tall piers, unless it were counteracted by some arrangement which is not visible in the design. This or analogous defects in the logical character of architectural compositions, may be observed in some of the other drawings exposed, as in No. 50, by Mr. Edmeston; for in the Warehouse here shown, there are straight stone lintels over the windows, strong enough to carry the superincumbent weight, but with heavily marked discharging arches over them on the ground floor; on the first and second floors there are segmental arches over the windows, whilst on the third and fourth there are pointed arches in the absurd style used in Florence—viz., deeper at the key than at the springing. These constructive errors cannot be pleasing to properly-educated eyes, for anything in opposition to constructive truth must be out of harmony, and architects especially must remember that

Le gout n'est rien qu'un bon sens délicat,
Et le génie est la raison sublime!—CHENIER.

The designs under 24 and 30, by Mr. E. B. Lamb, are free from this accusation, and are in good taste, because appropriate to the purposes the buildings are intended to fulfil, and combining correct proportions with rather massive grouping of details. As to the rather conspicuous designs, 72, 73, by Mr. C. J. Phipps; 85, by Messrs. Francis; 86, by Mr. C. H. Smith, little else can be said than that it is fortunate that none of them have been executed; and as to 91, it may be said of it that it has solved the very difficult problem of suggesting something positively uglier than the actual "Puff Palace" at Brompton. Mr. Smalman Smith has, in fact, in 91 given a specimen of what may be called engineer's taste, of which other examples are to be found in 101, 107, 141, and 239; and from them it may perhaps be inferred, that engineers err quite as much in confining their attention to the scientific branch of the architectural profession, as modern architects do in confining themselves to the more purely æsthetical portions.

Mr. J. P. Jones has some clever designs, grouped under 114; Mr. Horace Field's design (140), for the proposed terrace at Bayswater, has much merit, without however solving the difficulty in treating the entrance doors, the dining-room windows on the ground floors, and the openings on the first floors of ordinary London houses, in anything like an architecturally correct manner. Mr. Field has, in this part of his elevation, sacrificed the internal comfort of his drawing-room floor to the observance of the principle of bringing his openings one over the other; and has thus left a blank pier in the middle (or nearly the middle) of the room, but it is so hard to treat a narrow elevation to houses, planned as modern English houses are in almost all cases, that Mr. Field deserves great credit for what he actually has effected. The drawing (185), by Mr. De Ville, to which allusion has already been made, is remarkably clever, both as a mere drawing and as a design, and in its style superior to Mr. Godwin's selected one; but the correct harmony of its proportions would hardly strike uneducated eyes, or those of men who are only accustomed to find beauty in the productions of the romantic school. In the end, however, we believe that the classical style, modified to suit our climate and the building materials at the disposal of English architects, will prevail over the present fashion for mediævalism, and therefore we urge Mr. De Ville to continue his present course, notwithstanding the decision of the Northampton Town Council. The designs prepared by Messrs. Green and De Ville for the proposed Palais de Justice, Brussels (205, 210, and 225), have great merit, though perhaps they are deficient in this respect, that they have no distinctly marked centre, nothing, in fact, to prevent the eye from wandering over the whole surface of the elevation—a defect, by the way, likely to be exaggerated in execution on account of the perspective effects which must be produced by the nature of the ground. Mr. W. J. Green's design for some proposed improvements at Bath, is clever (228 and 237); and so is Mr. Shout's drawing (259) of the Manor House at Brompton. The drawings by E. W. Pugin, of St. Dominic's Church, Washington City (258a and 259a), are really wonderful, and would repay the most patient study by lovers of mediæval architecture. Mr. Knightley's (275) design of the Church of St. Mary's, Bethnal-green, is well worthy of notice, even after dwelling upon that of St. Dominic; and dispersed through the rooms there are a number of other designs of considerable merit, but which did not appear to us to present sufficient originality to merit detailed or special notice. For our own parts, we regret that the tendency of modern architecture, as indicated by this Exhibition, should be so decidedly in the direction of the romantic school, or, in other words, of mediævalism, as it evidently is. Many reasons, moral and metaphysical, might be urged against this tendency, which would be out of place here; but the most cogent of them may be considered to consist

in the indefinite and dreamy character it impresses upon artistic productions, and in the substitution of appeals to the sentiments of men rather than to their educated reason. Nevertheless, the class of sentiments mediæval art appeals to is so essential a part of man's moral constitution, that it cannot be passed aside in any general collection of the artistic manifestations of the human soul; the real subject of regret is, that it should be so exclusively cultivated to the prejudice of classic art, the type of reflective reason.

In the Architectural Exhibition there are, in addition to the original designs, a great number of studies and sketches of existing monuments, to which the attention of the public, and of students in particular, may be well directed. Mr. l'Anson has, under 25 and 147, some free bold sketches of continental antiquities; so has Mr. Spiers under 45, and Mr. Thomson under 87; and the sketches by Mr. Vaughan, the Soane Medallion student of the R.I.B. Architects, 229 to 236, are characterized by an amount of study and a perception of the characteristic beauties of the objects represented, highly creditable to their author. There are also in the Exhibition several photographs, of new and old buildings, of merit; but photography is so little of an art process, as it is generally practised, that the propriety of allowing it to appear here may fairly be questioned. Bedford's and Fenton's architectural photography are the only ones able to furnish subjects for an architect's studies, and neither of them is represented in this Exhibition. There are some large cartoons of stained glass windows exhibited under 155, by Mr. Gibbs, characterized by a ridiculous affectation of Archæism; and some studies of coloured glass by Mr. Seddon, which certainly do not give much reason for regretting the loss of much of this class of monuments. The church furniture, clerical robes, &c., are "well enough in their way," but unworthy of special notice here. The only remarkable thing connected with them is that they have been admitted within the walls of the Exhibition.

The collection of building materials interspersed through the assemblage of drawings is of a very inferior nature, and resembles much rather an advertising assortment than a selection of the new materials and processes introduced within the last twelvemonths. Thus, the Martin's cement is a material which has been known for years, and should only have been admitted in a collection of marble cements and stuccos; Ransome's patent stone is not represented in its newest form; Tisson's Suffolk bricks and tiles are not novelties; Bunnett and Co. have only sent their ordinary forms of metallic shutters, &c.; the zinc works exhibited by Mr. Tylor and Charles Devaux, the bankers, agents of the Vieille Montagne Company, neither elucidate the use of that metal, nor do they indicate the methods of obviating the objections to its application in London for external works. The Keynsham Blue Lias Lime Company (on the direction of which we are sorry to see the names of some professional men who ought to have kept entirely aloof from trade, in order to maintain their independence) has sent some samples of lime and cements, which certainly, as samples, look very well; but we suspect that it would be impossible to obtain from any natural argillo-calcareous beds materials of anything like equable composition, especially in the blue lias formation. As to Captain Scott's cement, it is (if we may judge by the specification of the patent) nothing but an under-burnt lime, which Vicat showed, nearly thirty years since, to possess the property of setting rapidly; but it is to be feared that the cementing materials thus obtained would not be permanent in certain positions—as, for instance, in sea-water. Bodmer's stone bricks seem to us to differ very little from the compressed béton of Coignet, samples of which are to be found in "Puff Palace;" and Georgi, and Bellman and Ivers, exhibit specimens of the same descriptions of work they have sent to the same show. Maw's tiles, and Arrowsmith's parquet floors, are also better represented at Brompton than in the Architectural Exhibition. As to the sash hangings and fastenings, the locks and bolts, the water-closet pans, &c., we only come to the conclusion, "that the things themselves are neither rich nor rare, but we wonder how the devil they got there." "Non ragionam di lor: ma guarda, e passa." If all reports be correct (viz., that materials are only admitted into this Exhibition on payment of a certain rent), it cannot be matter of surprise that the best inventions should not be represented; and we should, for our own parts, bitterly regret to find that the reports were true. The organizers of an Architectural Exhibition should not convert it into a species of commercial speculation—a bad copy of the International Puff Palace. For some reason or other this is the character of the collection of building materials in this Conduit-street Exhibition.

Fortune gives too much to many, enough to none.—*Martial*.

REVIEWS.

CONSTRUCTION OF COTTAGES.*

Books upon, and designs for, cottages are so numerous, that a collection of them might be made to fill a library of no insignificant dimensions. Every juvenile architect tries his strength in the vain endeavour to combine the several conditions held to be indispensable for these productions. He might, with an equal chance of success, waste his energies in attempts to square the circle or to construct a machine for perpetual motion. The problem is, to erect dwellings for the poorest classes which shall be healthy, convenient, ornamental, and at so low a cost as to pay a good interest for the capital expended upon them. It is seldom that the obvious question, "Are all these conditions indispensable?" is asked or regarded. People want to find a method of being benevolent without cost, to gratify a fastidious taste, and make money by it. This won't do. If it is required to please the eye and gratify the fancy in the erection of cottages, it is no more likely to pay, nor is it more reasonable to expect pecuniary profit from such a proceeding, than from laying out lawns or planting shrubberies. It is never a question whether these will pay a good per centage on the capital expended on them.

When a rich proprietor, having a taste for ornamental landscape, thinks the addition of a cottage or two will aid the effect of the trees and shrubs, or when he would mark his taste by having a pretty cottage at his park gates, he must be content to pay for this indulgence.

Were the problem reduced to its simplest form, and the only condition—namely, to provide the poor with suitable and decent lodgings, it may be, and is, in a thousand instances, done in a paying form. Repudiating all ornamentation, and taking materials at hand in almost any locality which can be selected in the British Islands, cottages can be produced for so small a cost as to enable the poorest labourer to pay a rent sufficient to meet a fair interest on the money expended. If a moderate benevolence is introduced as an element, we venture to say there need be no lack of habitations for the agricultural labourers anywhere.

The moral aspect of the subject is much dwelt on. Slated roofs, coloured bricks, or chiselled stone are by no means necessary to this. To furnish the labourer with all that is needed to preserve the decencies of life, and to encourage a commendable pride in neatness and comfort, are a small room, well warmed and ventilated, a smaller kitchen for conducting culinary operations, washing, and to store his gardening tools. Three bedrooms—one for the parents, and the others to separate the boys and girls. To these Lord Palmerston would add a small porch, and the addition is obviously very desirable. Now, it appears to us to be of little importance of what material the walls and roof are constructed, provided they are perfectly weather-proof; the chimneys large, and every room should have one, as the most effectual means of ventilation, with a few iron bars to form a cheap fire-place, and a good-sized window for that indispensable element of health and comfort—light. Water supply and drainage, of course, are supposed to be well cared for.

Assuming the case of the lowest wages earned by the labourer, he ought to be able to pay 1s. 6d. per week for such a dwelling, or 37. 18s. per annum. Such a cottage as we contemplate may be erected in most places, taking only the cost of material and labour, and allowing nothing for architect's fees or master-builder's profits, for from 25l. to 35l. The latter item of cost, when necessarily incurred, should be debited to benevolence. A few rods of ground, and the fencing added, and the rent we have supposed will pay enough. We venture to say that the employer of a well-housed labourer will find another and a better source of profit in the strength and endurance of work given to his service.

But it may be asked, is it fair or right to calculate on thus excluding the builder and architect? We think, in this particular department of building, they can afford to forego their profits. If the lowest of our poor were comfortably lodged, the class immediately above them, the skilled artisans and small tradesmen, would be excited to emulation, and would be satisfied with nothing less than architectural skill and workmanship requiring the master-builder. No one acquainted with our villages will deny the wideness of the scope this would open for both. Indeed, we are not sure whether the dwellings of the classes which are incomparably better off than agricultural

labourers, are not in as much need of improvement as theirs. For a long period taxes on every kind of material entering into the construction of houses, and even on the admission of light, repressed all improvement, and forbade the adoption of the principles derived from a more just appreciation of the laws and conditions of health. These, indeed, are by no means yet popularly recognised. But the freedom from taxation we now enjoy in respect to dwellings, the awaking attention to sanitary measures, and the general prevalence of some degree of æsthetic culture, seem to provide a splendid future to the architect.

We purpose to return to these subjects, and particularly to justify by details our assertions respecting the question of the lowest order of cottages.

Mr. Vincent's books and designs are creditable to his taste and skill. Whilst we admire his cottages, we cannot help doubting his estimates of cost. They are well adapted to the better classes—skilled artisans, small tradesmen, or to serve as ornaments to the domains of the rich, but we fear our commendations must end here.

STABLE ARCHITECTURE.*

We are certainly obliged to Mr. Knightley for his elegant and elaborate work, but must at the same time confess to a strong sense of disappointment when rising from a perusal of it. The scale is too large and the flight too high ever to be generally useful. He seldom or never descends to the level even of the ordinary country gentleman, much less to that of the cab or omnibus proprietor, and tradesman who keeps only one or two horses. In the last plate of the engravings (the twentieth), a plan of a two-stalled stable with loose-box and coach-house is given; but with this single exception all the plans are for large establishments, the model hunting-stable for eighteen horses, in the twenty-fourth plate, being the smallest of the whole series. To those noblemen or gentlemen who may be about to build either racing or hunting stables or kennels, we can strongly recommend Mr. Knightley's work, more especially as it gives excellent examples of some of those already in existence, including the stables of the Duke of Bedford and Baron Rothschild at Newmarket, and the Earl Fitzwilliam's at Wentworth, which may be safely followed, whilst the errors committed at the Royal Stables at Chantilly may be taken, on the other hand, as a warning.

The book is beautifully printed, and the engravings are highly creditable to all the parties concerned in their production, and if the author would only condescend to notice the fact that other people besides noblemen and millionaires have horses that require good and convenient stables, his work would be more generally useful and better entitled to the commendation of those who have the control of literary journals.

THOUGHTS, PRACTICAL AND PHILOSOPHIC.

INDIAN ARCHITECTURE.—It has been very usual, in writing of Indian art, to compare it with the Egyptian, or even classical styles, and to insist on resemblances and affinities which, I feel sure, a more intimate knowledge of the subject would prove to be utterly groundless. For myself, I have passed from India to Egypt, and from Egypt to India, and with my mind full of either style, and while its forms were still fresh in my memory, tried in vain to detect the slightest resemblance; which, however, I am convinced, does not exist, but that the Indian styles, whatever their merits or defects may be, are at least original, and have been elaborated in the country where we find them. If any connexion with any foreign style does exist, it must not, I am certain, be looked for beyond the seas, but must be traced through the countries on the westward of the Indus into Persia, and the countries of Central Asia; and I think it more than probable that we may there find styles of art either borrowed from India, or to which that country is indebted for many of its forms; but the materials for attempting any deductions from this train of reasoning are not yet available to the inquirer. Had the Indian armies, who occupied Afghanistan for some years, possessed an officer capable of appreciating the value of such inquiries, it would have been easy, from the details of the architecture of the topes and other buildings in that country, to have ascertained, at least, whether the inquiry would probably lead to any conclusive re-

* *Country Cottages: a Series of Designs for an Improved Class of Dwellings for Agricultural Labourers.* By John Vincent, Architect. London: E. and F. N. Spon.

* *Stable Architecture.* By Thomas Edward Knightley, F.R.I.B.A. London: Bailey Brothers.

sults; but the opportunity is lost, and it is not easy to foresee when it may again occur. The researches of Mr. Masson, Dr. Honigberger, and the French officers in Runjeet Sing's service, show us that Indian forms do extend at least to the confines of Persia; but neither their opportunities nor means were equal to those at the command of our officers, and their drawings, as hitherto published, are too imperfect to form any satisfactory conclusion from.—*Fergusson's Architecture of India.*

THE PHILOSOPHY OF PLATO AND BACON CONTRASTED.—Suppose that Justinian, when he closed the schools of Athens, had called on the last few sages who still haunted the Portico, and lingered round the ancient plane-trees, to show their title to public veneration. Suppose that he had said—"A thousand years have elapsed since, in this famous city, Socrates posed Protagoras and Hippias; during those thousand years a large proportion of the ablest men of every generation has been employed in constant efforts to bring to perfection the philosophy which you teach; that philosophy has been munificently patronized by the powerful; its professors have been held in the highest esteem by the public; it has drawn to itself nearly all the sap and vigour of the human intellect; and what has it effected? What profitable truth has it taught us, which we should not equally have known without it? What has it enabled us to do which we should not have been equally able to do without it?" Such questions, we suspect, would have puzzled Simplicius and Isidore. Ask a follower of Bacon what the new philosophy, as it was called in the time of Charles II., has effected for mankind, and his answer is ready—"It has lengthened life; it has mitigated pain; it has extinguished diseases; it has increased the fertility of the soil; it has given new securities to the mariner; it has furnished new arms to the warrior; it has spanned great rivers and estuaries with bridges of form unknown to our fathers; it has guided the thunderbolt innocuously from heaven to earth; it has lighted up the night with the splendour of the day; it has extended the range of the human vision; it has multiplied the power of the human muscles; it has accelerated motion; it has annihilated distance; it has facilitated intercourse, correspondence, all friendly offices, all despatch of business; it has enabled man to descend to the depths of the sea, to soar into the air, to penetrate securely to the noxious recesses of the earth, to traverse the land in cars which whirl along without horses, and the ocean in ships which run ten knots an hour against the wind. These are but a part of its fruits, and of its first fruits. For it is a philosophy which never rests, which has never attained, which is never perfect. Its law is progress. A point which yesterday was invisible is its goal to-day, and will be its starting-post to-morrow."—*MACAULAY.*

THREE CLASSES OF ARTISTS.—Artists considered as searchers after truth, are to be divided into three great classes—a right, a left, and a centre. Those on the right perceive and pursue the good and leave the evil; those in the centre, the greatest, perceive and pursue the good and evil together, the whole thing as it verily is; those on the left perceive and pursue the evil and leave the good. The first class, I say, take the good and leave the evil. Out of whatever is presented to them, they gather what it has of grace, and life, and light, and holiness, and leave all, or at least as much as possible, of the rest undrawn. The faces of their figures express no evil passions; the skies of their landscapes are without storm; the prevalent character of their colour is brightness, and of their chiaroscuro fulness of light. The early Italian and Flemish painters, Angelico and Hemling, Pertigino, Francia, Raphael, in his best time, John Bellini, and our own Stothard, belong eminently to this class. The second or greatest class render all that they see in nature unhesitatingly, with a kind of divine grasp and government of the whole, sympathizing with the good, and yet confessing, permitting, and bringing good out of the evil also. Their subject is infinite as nature, their colour equally balanced between splendour and sadness, reaching occasionally the highest degrees of both, and their chiaroscuro equally balanced between light and shade. The principal men of this class are Michael Angelo, Leonardo, Giotto, Tintoret, and Turner. Raphael, in his second time, Titian, and Rubens are transitional; the first inclining to the eclectic, and the last to the impure class; Raphael rarely giving all the evil, Titian and Rubens rarely all the good. The last class perceive and imitate evil only. They cannot draw the trunk of a tree without blasting and shattering it, nor a sky except covered with stormy clouds; they delight in the beggary and brutality of the human race; their colour is for the most part subdued and lurid, and the greatest spaces of their pictures are occupied by darkness. Happily, the examples of this class are seldom seen in perfection. Salvator Rosa and Caravaggio are the most cha-

racteristic; the other men belonging to it approach towards the central rank by imperceptible gradations, as they perceive and represent more and more of good. But Murillo, Zurbaran, Camillo, Procaccini, Rembrandt, and Teniers, all belong naturally to this lower class.

GOOD ADVICE.—Never build after you are five-and-forty; have five years' income in hand before you buy a brick; and always calculate the expense at double the estimate.—*KELK.*

THE HOUSE.—Houses were built to live in more than to look at; therefore let use be preferred before uniformity, except where both may be had.—*LORD BACON.*

ARCHITECTURE OF CLOTHING.—Neither in tailoring nor in legislating does man proceed by mere accident, but the hand is ever guided by mysterious operations of the mind. In all his modes and habilitory endeavours an architectural idea will be found lurking; his body and the cloth are the site and materials wherein and whereby his beautified edifice of a person is to be built, whether he flow gracefully out in folded mantles, based on light sandals; tower up in high head-gear from amidst peaks, spangles, and bell-girdles; swell out in starched ruffs, buckram stuffings and monstrous tuberosities, or girth himself into separate sections and front the world, an agglomeration of four limbs, will depend on the nature of such architectural idea, whether Grecian, Gothic, later Gothic, or altogether modern and Parisian, or Anglo-Druidical. Again, what meaning lies in colour! From the soberest drab to the high-flaming scarlet, spiritual idiosyncrasies unfold themselves in choice of colours; if the cut betoken intellect and talent, so does the colour betoken temper and heart. In all which, amongst nations as amongst individuals, there is an incessant, indubital, though infinitely complex working of causes and effect. Every snip of the scissors has been regulated and prescribed by ever-active influences, which, doubtless, to intelligences of a superior order, are neither invisible nor illegible.—*CARLYLE.*

PATENTS CONNECTED WITH BUILDING.

APPARATUS FOR LIGHTING.—J. E. M. de Pradon and L. G. Lecoq, Paris. Dated 5th July, 1861.—The essentially new principle of this improved apparatus, which is more especially applicable to lighting the stage and house of theatres, is based on the application of the luminous rays sent back by direct and indirect interior reflection into capacities of the shape of pipes, allowing to conduct to the exterior the odours and deleterious gases resulting from the employment of gas, and its combustion, in buildings and places in which it is essential that the deleterious gases of combustion should be expelled into the open air. And the invention consists in the employment of a pipe or conduit on which the gas-burners are mounted; the whole being enclosed in a reflector, the interior of which will reflect the luminous rays and throw them on a polished or unpolished glass. Screens of various colours are placed at will in such a manner that the lighting can be obtained in the tone required.

WET GAS METERS.—W. Livesey, Park-village East, Middlesex. Dated 29th June, 1861.—This invention has for its object to connect the meter direct to the iron service-pipes, without the use of lead or other flexible pipes or soldered joints; to regulate the opening and closing of the inlet and outlet pipes simultaneously; to ascertain the level of the water inside the meter without putting the meter out of action; to prevent the oscillation of the lights from any sudden increase or irregularity in the pressure; to prevent any injurious effect upon the registration from the meter being tilted or placed out of its level; and to simplify the index. The invention cannot be described without reference to the drawings.

FIRE-PROOF BUILDINGS.—H. C. Hill, Staleybridge, Lancashire. Dated 17th August, 1861.—This invention consists in making the beams, girders, columns, and other parts employed in the construction of buildings, hollow, for the purpose of containing water or other liquid; and in connecting these beams, girders, columns, and other parts, so that the water or other liquid with which they are filled may circulate therein or be renewed when required. By this means, in case of fire in the building, the main supports can never become so hot as to be injured or weakened by the results of heat.

KNAPP'S PATENT PAVEMENT, POULTREY.—As an experiment the roadway in the Poultry is being laid with Knapp's patent pavement, which consists of hollow iron blocks, divided into small compartments, filled up with concrete level with the surface. Four of these blocks will make a square yard. On each side of the road, close to the edge

of the footway, are being laid hollow cast-iron tram-plates, six feet in length and eighteen inches broad, which are first filled with concrete, and then turned over, leaving the indented iron face upwards, thus forming solid tramways. To keep the paving level at each end, iron girders eighteen feet nine inches in length will cross the roadway. Each of the blocks are cast in the same mould, so that the whole of them, it is said, will lock into each other, and form a solid mass of iron and concrete of great strength and durability. The work commences at the corner of Charlotte-row, Mansion-house, and extends about one hundred yards westward from that point.

CONSERVATORIES, ORCHARD-HOUSES, AND OTHER HORTICULTURAL ERECTIONS.—J. Cranston, Birmingham. Dated 24th August, 1861.—This invention applies to horticultural buildings to be constructed of wood and glass, and also to erections for any other purposes in which the same principle of construction is carried out; but, with the use of iron, zinc, copper, tin, lead, or other suitable material in the place of glass; all the buildings being pinned and screwed together, and made to rest upon blocks of wood or butts of trees sunk in the ground; so that they can be erected with great ease and are portable.

MACHINERY FOR DRESSING SLATES.—C. E. Amos, Grove, South-wark, and J. Francis, Penrhyn Slate Quarries, near Bangor. Dated 27th July, 1861.—This invention relates to a novel arrangement of machinery whereby roofing slates may be cut, trimmed, or dressed to the different sizes used for building purposes. The machine consists of a rectangular frame, which may, if necessary, be mounted on wheels for the convenience of transporting or removing the machine from one locality to another. This frame is provided with a fixed knife, and also suitable bearings for a lever or "sword arm" which carries a moveable knife. The "sword arm" or lever is suspended by a spring or springs; so that, when in a normal position, the moveable cutting edge is raised above the lower knife edge, and the two edges resemble a pair of open "shears," and act in the same manner.

MANUFACTURE OF BOXES, CASES, TUBES, RINGS, &c.—J. R. Black, Summer-place, Onalow-square, and H. W. Spratt, Walbrook-buildings. Dated 6th July, 1861.—This invention consists in an improved mode of constructing and manufacturing boxes, cases, tubes, rings, and other suchlike articles (some of which have been usually made of pasteboard or thin wood and paper), by moulding and forcibly compressing into the form required pulp made from vegetable or animal fibres, in conjunction with earthy matter, starch, size, gum, oil, glycerine, resin, or other similar stiffening substance. The machinery employed is of the following construction:—The patentees employ a mould or die to receive the pulpy substance. They then employ one or more plungers to mould and forcibly compress it into the form required. The mould or plunger is pierced so as to permit the air and water to pass through it.

VENEERING PRESSES.—C. Board, Bristol. Dated 21st September, 1861.—Upon a strong wood or metal frame the patentee lays and secures a sheet or plate of zinc or other metal, on the upper surface of which he fixes metal bars, in such manner that series of chambers or passages, extending from end to end of the plate, are formed. He places strips of wood, or other suitable material, at the ends and sides; and he covers the whole with another sheet of metal, similar to the first, in order to obtain a smooth and hollow bed on which to perform the veneering. Having formed the hollow bed, he places pipes below it in communication with the ends of each of the passages; at one end of which he admits steam, hot air, or hot water, which, travelling along the passage, passes off at the other end. Clamps are fitted to the press, which, for convenience, he hinges at one end of the frame.

IMPROVEMENTS IN TREATING STONE, BRICKS, AND OTHER SURFACES AND IN THE MANUFACTURE OF FILTERS.—F. M. and E. L. Ransome, Ipswich. Dated 16th September, 1861.—For the purpose of treating stone, bricks, and other surfaces, the patentees employ powdered glass, or other vitrified or hard substance, or powdered flint, or powdered stone, or sand mixed with soluble silicate, with or without colouring matter; the object being so to apply soluble silicate that it may, for the most part, be retained in combination with the pulverized substance on the surface of the stone, bricks, or other substances to which it may be applied; and this is effected by the admixture of the pulverized substances with it. The compound of soluble silicate and pulverized matter or matters having been applied to the surface of the stone, bricks, or other material, the soluble silicate is then rendered insoluble in like manner to that practised when impregnating stone or other substances with soluble silicate; but by this mode of treatment the pulverized matters will be combined with the silicate (which is ren-

dered insoluble) on the surface of the stone, bricks, or other substances. When making parts of filters of pulverized stone, sand, or other materials, cemented by soluble silicate, and also, when using other porous stone or material, the patentees form such porous matters into hollow triangular forms or tubes, by which they are enabled to obtain more extended filtering substances within a given space than can be obtained by other constructions of filters; and such triangular tubes may be combined at pleasure, according to various arrangements.

FITTINGS AND METHOD OF HANGING WINDOW-SASHES.—J. Gurman, Southampton. Dated 18th September, 1861.—This invention relates, first, to the fitting and hanging of window-sashes in such manner that they can be readily removed from the frames for cleaning and other purposes without the necessity of disturbing the beads. To effect this, the patentee forms what he terms a pocket in one side of the window-frame, similar to that which is sometimes made to get at the counter-balance weights. He makes such pocket somewhat longer than one of the sashes; and fits it with pieces jointed together in the length; the upper end having a spring catch, and the lower one fitting into a step or socket, or *vice versa*; by which means such pieces may be released and slid out and into position; the sash at the time being in a suitable position. In this pocket-piece he also comprises part of the bead that separates the sashes; so that when the pocket-piece is removed, a part of the bead of some length also comes out. The pocket-piece having been removed, the inside sash is slid into the position embraced by the pocket, and may there be moved laterally to an extent of, say three-fourths of an inch, which is sufficient to clear the bead on the opposite side, and the sash so removed from the frame. In order to attach the cords readily, he secures a metal-piece to the end of the cord, which piece has a globular enlargement at the end: this is received in a socket fixed to the sash, from which it may be readily detached in the manner of a door-chain. In the piece attached to the cord he forms a hole or socket to receive the end of the cord, which he secures thereto by one or more bending screws. The outside sash may also be slid to position opposite the pocket, into which it may be moved laterally: being first moved inwards a little on the pocket side, for which it is free; the mid or parting bead being removed at that point, as before mentioned. The attachments of the cords are as before described; and in this way both sashes are readily capable of removal. The next part of these improvements relates to the fittings of sashes which balance each other. For this purpose he uses cords with suitable metal attachments, such as before described; and at the one end he applies a regulating screw, which can be turned at pleasure to regulate the length of the cord, to allow for expansion and contraction thereof, and insure the simultaneous closing of the upper and lower sashes. The pulleys over which the cords pass to connect the two sashes are situate in the mid bead, or bead disposed between the two sashes. He forms the bracket or piece in which such pulley is mounted with a frame or part to form the continuation of such bead, and so give the whole a perfect appearance, and ensure the necessary strength.

IMPROVEMENTS IN THE MANUFACTURE OF STONES, BRICKS, TILES, SLABS, STATUARY, AND SUCH LIKE MATERIALS, AND IN THE METHOD OF AND MEANS FOR CLEANSING AND INDURATING THE SAME.—J. C. Combe and J. Wright, Bridge-street, Blackfriars, London. Dated 19th September, 1861.—The patentees propose to make use of a solution of silicate of potash, weak or strong, as required by circumstances; and then to add to this solution a sufficient quantity of hydrofluo-silicic acid, weak or strong as required; but preponderating in its equivalent, so as to leave the mixture decidedly acid.

ROOF AND OTHER LIGHTS.—R. Smith, Hornsey; B. Brookes, King's-cross; and J. Smith, Tottenham. Dated 13th September, 1861.—The patentees form the bars and other parts where they support the glass with longitudinal recesses or gutters, over which the edges of the glass are laid; and the glass is then retained by putty in the usual way, or by other suitable holding means. When from any cause the putty or other holding means admits water through it, such water, after passing under the edges of the glass, in place of dropping at once therefrom, will be received into the longitudinal recesses or gutters, and by them may be conducted to suitable channels or receivers.

The governors of St. Thomas's Hospital are in treaty with the Company of Fishmongers for the use of seven acres of land at Walworth for a temporary hospital, which, there is no doubt, could be easily erected before August.

GENERAL INTELLIGENCE.

BUILDING WORKS IN THE BOROUGH OF LIVERPOOL.—The twenty-fourth annual report of Mr. William Rishton, the building surveyor, to the local Health Committee has been printed. From this report it appears that, although the number of dwelling-houses erected in 1861 is somewhat below the average of the six years 1855-60, it greatly exceeds that of the six years 1849-54; being, for the last year, 1250 against 1600,—the average in the previous six years, and 765 the average in the six years prior thereto. The great majority of the premises are of a better class than those erected in 1860. The number of houses built in that year producing a rental less than 12*l.* per annum was 161; whilst in the past twelve months there were only 45 of this class built. In 1861 only 109 premises were constructed with separate cellar dwellings, against 192 in 1860; and though there was an increase last year of 81 terrace houses, some of these were of a greatly improved character. In new dwelling-houses the middens have been disallowed, and in 185 cases of houses previously built, cesspools have been abolished, and water-closets provided. The new erections in the borough of a large character other than dwellings have been nearly equal to those of 1860, except in the instance of warehouses, which were 19 in 1861, against 32 in 1860. Notwithstanding the reduction in the number of erections in 1861, the amount expended on old and new buildings is nearly 14,000*l.* more for 1861 than for 1860, which was a period of very large expenditure.

THE LATE MR. JOHN THOMAS.—The *Scotsman* says, Mr. John Thomas, the eminent sculptor, died at his residence, Florentine Villa, London, on the 9th April. He was born at Chalford, in Gloucestershire, in 1813, and has died in the forty-ninth year of his age. His extraordinary fertility of invention, wonderful rapidity of execution, and accurate knowledge in every department of decorative and architectural sculpture, caused him to be extensively employed by almost all the leading architects in the kingdom; and his works—whether in wood, metal, stone, or marble—were all characterized by elegance and originality. He was equally at home in every style, and master of every detail, whether Roman, Italian, or Gothic, and his productions are to be found in many of the principal structures in the chief towns of the kingdom. Mr. Thomas had the honour to be extensively employed by the late Prince Consort, and executed, in a way to elicit the commendation of royalty, large bas-relief panels of Peace and War for Buckingham Palace, as well as similar works for Windsor Castle, Balmoral Castle, and others of the royal palaces. The model dairy at Windsor was designed and executed for Prince Albert by Mr. Thomas. The whole interior is lined with encaustic and Majolica, with characteristic figures, emblems, devices, and mottoes, executed in colour from the designs and models of Mr. Thomas. The enormous lions on the entrance piers at the Britannia Bridge, Menai Straits, each measuring nearly thirty feet in length, were executed by Mr. Thomas; and, even in their gigantic dimensions, display symmetrical proportion and masterly conception. The large bas-reliefs in the station at Euston-square, as well as the pediment and figures in the front elevation of the Great Western Station, are also the production of Mr. Thomas. The sculpture at the new works at the Serpentine, as well as that at the grand entrance gateway to Buckingham Palace, are also by him; and these are but a tithe of the innumerable productions of his extraordinary, industrious, and versatile genius. Public monuments have been erected by him in many of the chief towns in England; and, in addition to this, he was architect of several mansions, among others of which may be named Somerleyton—the seat of his early patron and friend, Sir Morton Peto. In Glasgow are to be seen a few of the works of Mr. Thomas. The sculptures on the front of the National Bank and in the new telling-room of the Union Bank are specimens of his skill. Another work of his there, the beautiful mausoleum of the Houldsworth family, with its figures of Faith, Hope, and Charity, is a model of purity, both in its sculpture and architecture. The late Mr. John Houldsworth had his new house decorated and furnished by Mr. Thomas. The ceilings and walls of the principal apartments were enriched and coloured from his designs; and mantelpieces and doors of inlaid woods and marbles, floors of marquetry, marble statuettes appropriate to the rooms in which they were placed, tables, chairs, carpets, and curtains, all in unison, from Mr. Thomas's designs, rendered this house altogether a perfect specimen of the unity and harmony so much desiderated in internal furnishing and decoration. In Edinburgh we have a few specimens of Mr. Thomas's works—the architectural sculpture on the Life Assurance buildings in Princes-street, the group of figures in the Masonic Hall, George-street, and the quaint

figures on the unique fountain at Holyrood. While carrying on a very extensive business as an architectural sculptor, Mr. Thomas applied himself to high-class art; and his figures of Musidora, Godiva, and others, exhibited in the Royal Academy, were received with well-merited commendation. The forthcoming International Exhibition will, we understand, be enriched with several specimens of Mr. Thomas's skill. Messrs. Minton are to exhibit a large Majolica fountain, designed by Mr. Thomas, in the Great Western Transept. It is most elaborate, both in design and execution, and colossal in dimensions. But by far the most interesting production of Mr. Thomas to be exhibited is a model on a large scale of a monument to Shakspeare, the design for which, we believe, was submitted to, and approved by, the Prince Consort. The model is between twenty and thirty feet in height; the figure of Shakspeare, which is eight feet in height, is seated on a circular pedestal, enriched with figures from his works; and on each side, on ante-pedestals, are figures of Tragedy and Comedy. This design has been the dream of the lamented artist for many years, and there is some reason to fear that his strength may have been over-taxed by his anxiety and labour in connexion with this model and the many other works he had in hand. The want of a national monument to our great national bard has been long felt, and it will be pleasing if this noble production, freely contributed, should be carried to completion, and erected on a colossal scale on some prominent site. In private life Mr. Thomas was all that could be desired. He was on the most intimate terms with all the leading artists in London, and he delighted to be able to lend a helping hand to genius and worth. He was an agreeable companion, a kind friend, and a most affectionate husband and father. He leaves a widow, an only daughter, and many friends, to lament his death; while his works will carry his name far into futurity.

EFFERTZ'S MACHINERY FOR MAKING BRICKS AND TILES.—This machine is the invention of Peter Effertz, of Manchester, and is for producing perforated, solid, and paving bricks, gutter tiles, roofing tiles, cornice tiles, pantiles, drain-pipes, and other similar articles. The clay is fed into the machine through a hopper, mixed by a combination of screws passed through a grate, to be cleansed from stones and other objectionable matters, modelled or moulded by pressure to the desired shape, and received as an endless band by a rolling-table in front of the machine. This rolling-table is provided with a self-acting cutter, put in motion by the band of clay emerging from the machine, and cutting the said band into any length desired at right angles to the surface, or at an angle proportionate with the velocity. The necessary pressure is exerted through a combination of screws requiring less power than any other now in use. The machine consists of two main parts or divisions: first, the press for mixing, cleansing, and shaping the clay; secondly, the self-acting cutting-table, on which the band of clay emerging from the mould is cut. The *Engineer* of the 25th ult. gives diagrams of the details, with particulars of the mode of working.

NOTICE TO CORRESPONDENTS.

IN the execution of the Plates which form our Illustrations, we hope always to have the advantage of the drawings of the Architects whose buildings we represent. We also invite those gentlemen, in every instance, to communicate both with our artists and ourselves during the progress of our engravings, and we shall always be anxious to secure their approval for every illustration on its completion.

The lithographs contained in the present Part have all been executed from the original drawings of the Architect, and also from his working drawings, with the additional aid of photography; and they will doubtless be preserved and valued as faithful pictures of an interesting public monument, and a chaste example of the street architecture of London in the Victorian age.

All communications for the Editor to be addressed to the care of DARTON AND HODGE, Publishers, Holborn-hill, E.C.

A GLANCE AT THE RISE AND PROGRESS OF
GOTHIC ARCHITECTURE.

ORACE WALPOLE'S plan of a history of Gothic architecture is as good as any that has been hitherto suggested. The designer and proprietor of the Gothic Castle of Strawberry Hill, writing to his friend the Rev. William Cole, says: "Were I to execute it (the History of Gothic Architecture), I would give a series of plates, even from the conclusion of Saxon architecture, beginning with the round Roman arch, and going on to show how they plastered and zigzagged it, and then how better ornaments crept in, till the beautiful Gothic arrived at its perfection; then how it deceased in Henry VIII.'s reign, Archbishop Warham's tomb at Canterbury being, I believe, the last example of unbastardised Gothic. A very few plates more would demonstrate its change, though Holbein embroidered it with some morsels of true architecture. In Queen Elizabeth's reign there was scarce any architecture at all—I mean no pillars, or seldom—buildings then becoming quite plain. Under James, a barbarous composition succeeded. . . . The next part should consist of observations on the art, proportions, and method of building, and the reasons observed by the Gothic architects for what they did. This would show what great men they were, and how they raised such aerial and stupendous masses, though unassisted by half the lights now enjoyed by their successors. . . . The last part (I don't know whether it should not be first) must be to ascertain the chronologic period of each building, and not only of each building but of each tomb that shall be exhibited, for you know the great delicacy and richness of Gothic ornaments were exhausted on small chapels, oratories, and tombs."

Following the recommendations of the Earl of Orford as far as beginning with the so-called Saxon church architecture is concerned, we may here observe that the first Saxon churches in this country were all built of wood. The first church in Northumbria was built of wood; so the church of Holy Island. The church at Durham was built of split oak, and covered with reeds, like those of the Scots. In Greensted Church, in Essex, the most ancient part, the nave or body of the church, was entirely composed of the trunks of large oaks, split, and rough-hewed on both sides. They were set upright and close to each other, being let into a sill at the bottom, and a plate at the top, where they were fastened with wooden pins. These wooden churches were gradually displaced by stone structures.

The chief peculiarities of the Anglo-Saxon architecture, of which several specimens, though in fragments, exist, are declared to be a want of uniformity of parts—massy columns, semicircular arches, and diagonal mouldings. Of these the two first are common to all the barbaric architecture of Europe. But the semicircular arches and diagonal mouldings seem to have been more peculiar

additions to the Saxon buildings. The universal diagonal ornament, or zigzag moulding, which is a very distinguishing trait of the Saxon style, is found disposed in two ways—one with its point projecting outwards, and the other with its point lying so as to follow the lines which circumscribe it, either horizontal, perpendicular, or circular. It is supposed that many specimens of ancient Saxon architecture yet remain, as part of St. Peter's at Oxford, part of St. Alban's Abbey Church, Tickencote Church, near Stamford, in Lincolnshire, the porch on the south side of Sherborne Minster, Barfreton Church, in Kent, Iffley Church, and some others.

Not until the Norman Conquerors of the Saxons had been firmly established in this country did the Gothic or Pointed style of architecture grow and prevail in our land. But the Normans were not the inventors or originators of this style. Here, then, we at once come to the question, Who were the originators of the Gothic style of architecture?

This question—where, when, and with whom the Pointed or Gothic form of arch originated—has been more discussed and disputed than the discovery of the properties of the arch itself. Its invention has been accorded to, or claimed by, almost every nation, civilized and uncivilized. There is one striking fact, however, which has been too much overlooked by many of the theorists in the discussion of the question; it is, that the pointed arch made its appearance almost at the same moment of time in all the civilized countries of Europe. This is proved by the controversies of those who claim its invention for their respective nations, for none of them can produce genuine specimens of it before a certain period, and to this period all of them can reach. This almost simultaneous introduction of the pointed arch among the nations of Europe took place immediately after the first crusade. In this crusade all the nations of Europe took a part. Now, when this fact is borne in mind, coupled with the other fact, that the pointed arch was known to the Saracenic or Mahometan nations, and that they were never known to adopt any European custom, it is difficult to resist the conclusion that the lancet arch, which is the germ of the Gothic style, was derived by the Crusaders from the Saracens.

In support of this theory there is another very striking historical fact, that the Norman Conquerors of South Italy, before they crossed over to Sicily, never in any of their architectural achievements departed from the round or Romanesque style. The remains of all their buildings in Calabria testify a studious endeavour to imitate the works of the Romans. Until about the conclusion of the eleventh century this style continued unaltered. The Normans who crossed the Straits of Messina, and obtained a footing on the eastern part of Sicily, continued to build in the same Romanesque style. But Sicily was no sooner conquered, than from that moment the Normans adopted a style totally different from the style which they had adopted anywhere else—totally different from that which had up to that time been employed by any nation of Europe; and having once adopted it, they ever afterwards

adhered to it in Sicily. This new Norman style was no other than the pointed or lancet style, and this style the Normans borrowed or adopted from their Mahometan or Saracenic predecessors in the government of Sicily. To these vanquished Saracens the victorious Normans, with a statesmanlike instinct which proved them to be the predestined imperial race of the modern world, conceded a wise and generous toleration. During the Norman dominion in Sicily, the code of the Roman Emperor and the precepts of the Arabian Prophet equally continued to be the law. In public documents the Arabic was employed concurrently with the two great dialects of the Christian world; and the descendants of the Scandinavian conquerors copied the costume and ceremonial of Byzantium, and adopted the luxuries and customs to which the subjects of the Caliphs owed at once their degeneracy and their civilization.

In endeavouring to trace the origin of Gothic architecture there is another consideration which ought not to be lost sight of—namely, that some of the very earliest specimens of the pointed arch are to be found in Venice, both in private houses and in the Basilica of St. Mark. In the former they are generally of the oggee,* or contrasted form, in windows formed by columns or mullions, with in certain places approaches to foliations and tracery; and in the Basilica, the lancet arch is not uncommon. The well-known commercial connexion of that city with the Asiatic nations may easily account for the presence of this style in her buildings even before the first crusade; in fact, the Venetians were the carriers, and Venice the stepping-stone between Europe and the Holy Land. The conclusion, therefore, would seem to be inevitable that the pointed arch is of Oriental, if not of Arabian, origin, and that its universal adoption by the nations of Christendom dates from the return of the first crusaders from their expedition to Palestine. It does not, however, appear that the pointed arch, on its first introduction into Europe, was accompanied by its ordinary accessories in after time—its light clustered pillars, its mullions, foliations, or featherings, and graceful tracery—all these resulted from its adoption; so that whether the arch itself was invented in Europe, or imported from the East, to the European nations must be assigned the credit of educating the beautiful style of which the pointed arch is the most remarkable feature.

But neither Christians nor Mahometans, Arabians nor Europeans, can establish a claim to be the inventors of this form of arch. To find its origin, or at least its earliest manifestation, we must go further eastwards than either Palestine or Arabia. Mr. Crawford, in his "Journal of an Embassy to the Court of Ava," in the year 1827, writes:—"The Gothic arch is observable in all the ancient temples, a characteristic which does not mark modern buildings." M. Lenormant conceives the *Ogive* to have come originally from Persia; the Palace of Sapor, and the other monuments of the Sassanides, present many examples of it. The same gentleman has also seen in

Egypt Ogives of the ninth century. Sicily, Naples, and Venice would seem to have been the link connecting the architecture of the East with that of the West. More than this. It is found in the Pyramids of Meroe, as old as eight centuries before Christ, and Sir Gardner Wilkinson has pointed out its frequent use in the Christian churches of the Thibaid long before the era of the Hejira.

In Ethiopia Mr. Hoskins found stone arches vaulting the roofs of the porches of the pyramids, perfect in construction, and showing both circular and *pointed* forms. These are probably of the time of Tirhakah, or at all events not earlier than the age of Solomon, nor later than that of Cambyzes. In his researches at Nimroud, Layard discovered vaulted drains and chambers of both circular and pointed forms. The assigned date of these is about the eighth or ninth century before our era. It is remarkable that we find the pointed arch in the earliest Christian church of which we have any knowledge, that church being the one built in the age of Constantine over the tomb of Our Saviour at Jerusalem. Pointed arches reappear in the aqueducts of Justinian at Constantinople, and evidently were becoming, or had become, a current feature of architectural decoration at the time of the great Moslem irruption. Indeed, the Saracenic architects used them almost exclusively. They are found in the oldest part of the Mosque which Amrou built at Fostat, or Old Cairo, in the middle of the seventh century of our era. No others are used constructively in the great Mosque El Aksah built at Jerusalem at the end of that century; and in the Mosque of Ebn Toulon at Cairo, erected in the ninth century, the pointed arch is an essential and perfectly established element of art, wholly superseding the round arch, or anything approaching to it. In brief, no fact is better established than that this form of arch was used by the first Saracenic architects a few years after the commencement of the Moslem domination, and that during the ninth century of our era it had become as essential a part of that art as it was of Christian art in France in the thirteenth century.

The theories respecting the germinal type, or seminal idea, from which the Gothic style has grown, are no less numerous and contradictory than those theories which profess to point out its first practisers. We will in this place glance at a few of them. First, then, there is the theory of Bishop Warburton, that natural groves suggested the primitive idea—the trunks, branches, and foliage of the trees being represented in the pillars, arches, and tracery of the Gothic. Second, the theory of Sir James Hall, that the whole style, in all its varieties, is but an imitation of wickerwork. This opinion of Sir J. Hall's is frequently, but erroneously, regarded as mere modification of Warburton's, with which in reality it has no necessary connexion. Third, there is the theory of Sir Christopher Wren, that the Freemasons were the inventors of the pointed arch. Fourth, there is a theory which has its principal upholders in Germany, that the pointed Gothic arch is but an imitation of the Egyptian acute-angled ceiling of the pyramids. Fifth, there is the

* The oggee or ogive arch is a pointed one, the sides of which are each formed of two contrasted curves.

hypothesis first incidentally propounded by Mr. Bentham, subsequently methodized and illustrated by Dr. Milner, to the effect that the intersections of semicircular arches, formed by interlaced panels, in Norman cathedrals and churches, gave the primitive model. Sixth, there is the theory of Dr. Whitaker, that pointed arches were known to, and constructed by, the Romans during the empire; that these arches originated in cross vaults, such as may be seen in the Palace of Diocletian, at Spalatro, in Dalmatia. This last opinion has received the high endorsement of Dr. Whewell,* of Trinity College, Cambridge. We will consider one or two of these hypotheses.

The theory which derives the Gothic from groves, and tree-trunks, and avenues, is scouted by Mr. Ruskin, as being brought forward by persons ignorant of the history of architecture. On the other hand, the theory, to some extent, is countenanced by gentlemen whose knowledge of history may be fairly presumed to be equal to Mr. Ruskin's. At any rate there can be no doubt that much of that luxuriant ornamentation which has become identified with Gothic Architecture has been derived from or suggested by the vegetable kingdom. On this subject M. Michelet, remarking on the different developments of the Gothic type among the principal European nations, says:—"Our Norman cathedrals are singularly numerous, beautiful, and varied; their daughters of England are marvellously rich, and delicately and subtly wrought. But the mystic genius seems more strongly stamped on the German Churches. The land there was well prepared; the soil expressly fitted to bear the flowers of Christ. Nowhere have man and nature—that brother and sister—disported in purer love under the Father's eye. The German mind has attached itself with simple faith to the flowers, trees, and beautiful mountains of God, and *has reared out of them*, in its simplicity, miracles of Art, just as at the anniversary of the Nativity they arrange the Christmas-tree, hung all over with garlands, ribands, and little lamps, to delight the hearts of their children."

Then, as to Dr. Milner, who stands up resolutely for the claim of the Anglo-Normans to be the founders of the "pointed style," and who professes to have discovered the type of the Gothic arch in the accidental interlacings of round arches. In his zeal to establish this theory, the reverend archæologist went the length of pointing out the identical building, and the particular part of the building, from which the whole of the Gothic structures in the world derived their existence. This building, according to Dr. Milner, was no other than St. Cross, Winchester. Unfortunately, however, for the claim of Winchester to this honour, it is now well-known that similar combinations of arches were still visible in Lombardy of a much earlier date than that of St. Cross.

In endeavouring to trace the origin and growth of this style, it is important to bear in mind that the earliest applications of the term Gothic had no necessary reference to the pointed arch, the Ogive, the traceries and folia-

tions which are, in our time, almost constantly associated with the mention of that name.

The term "Gothic Architecture," like the name "Christian," was first used as a derisive designation. It is supposed to have been invented about the middle of the sixteenth century, by the restorers of the Grecian orders of architecture in Italy. It denoted every species of European architecture which did not conform to the classical orders. From Italy the term was imported into England, and applied in the same sense. Mr. Evelyn describes Gothic architecture as a congeries of heavy, dark, melancholy piles. In the same spirit Sir Christopher Wren speaks of it as "mountains of stone; vast, gigantic buildings, but not worthy the name of Architecture." According to this acceptance of the term, the recorded time of building numerous Gothic churches is from the reign of Constantine the Great, in the fourth century, to the restoration of Roman Classic Temple Architecture in the sixteenth century.

The truth with regard to what is designated as Gothic Architecture would seem to be that, like the British Constitution, it was not made or invented by any one man or nation. It is the gradual growth of ages, and the accumulated result of the contributions of many nations. It was developed, or rather evolved, from the repeated collisions of various and antagonistic races, religions, and ideas. Mr. Gally Knight's hypothesis, which derives it from all parts of the Old World, is, in our opinion, the most truthful, as well as the most catholic, of all the views that have been expressed on this subject. But even Mr. Knight's theory falls short of the fundamental or living root of the style. His words are, that "the style of Architecture which we call cathedral or monastic, is manifestly a corruption of the sacred architecture of the Greeks or Romans, by a mixture of the Moorish or Saracenic, which is formed out of a combination of the Egyptian, Persian, and Hindoo."

This is a broad but a shallow view. To the intelligent eye, something very different from "corruption," and far higher and deeper than "combination," is discoverable in Gothic, or, as it has at least with equal propriety been termed, "Christian Architecture." It has a vital principle and organic law of its own. These are to be found in the genius of Christianity, in its chief mystery the Passion, and in the history of art and its manifold metempsychosis.

Ars, in Latin, is the contrary of *in-ers*; it is the contrary of inaction, it is action. In Greek, action is named *drama*, the drama is pre-eminently the action of the art, being the principle and the end of art. Art, action, drama are strangers to matter. For inert matter to become spirit it must be subdued, it must suffer. It must allow itself to be divided, torn, beaten, sculptured, changed. It must endure the hammer, the chisel, the anvil; must cry, hiss, groan. This is its passion. Remember the old ballad of the "Death of John Barleycorn," what he suffers under the flail, the kiln, the mill, the vat. Even so the grape in the winepress. The winepress is often the shape of the cross of the Son of Man. Man,

* See "Sacred Architecture," by Professor Richard Brown, pp. 126 et seq.

grape, Barleycorn, all acquire, under torture, their highest form. Hitherto gross and material, they become spirit. The stone also breathes and gains a soul under the artist's hand, who calls life out of it. Well is the sculptor named in the middle age, *Magister de vivis lapidibus* (the master of living stones).

This dramatic conflict between man and nature is for the latter at once passion and incarnation, destruction and generation. Between them they engender a common fruit, partaking of the mixed character of the father and the mother; nature humanized, mother spiritualized. This is strikingly the case in India, where we meet alternately with male and female monuments. The fecundity of this twofold drama seems to have been apprehended by the Hindoos. The Indian fig, the *bôdhi*, that tree forest which from every branch sends down a tree to the ground, that arcade of arcades, that pyramid of pyramids, is, they say, the dwelling under which the Deity reached the perfect condition of contemplation, the condition of the *bôdhi*, the buddhist, the absolute sage. This tree in which there are so many trees, this thought in which there are so many thoughts, grow up together and aspire after union; this is the ideal of fecundity, of creation. Aspiration, aggregation, these are the male and female principles, the paternal and maternal, the two principles of the great world of nature and of the little world of art. Let us rather say the sole principle; aggregation first, then aspiration, of all into one, of all towards one, as all the lines of the pyramid tend to a single point. The abstract pyramidal form is reducible to three lines, is in fact the triangle. In the ogival triangle, in the ogive, two lines are curved, that is, composed of an infinity of straight lines. This common aspiration of lines infinite in number, which is the mystery of the ogive, appears in India and in Persia.

From India to Germany, from Persia to France, is a long way. Identical in its principle, art varies along its route. At first, on quitting Asia, the Greek Temple, a simple reunion of columns under the flattened triangle of the pediment, scarcely presents a reminiscence of that heavenward aspiration which characterized the monuments of India, Persia, and Egypt. The aspiration disappears; the beauty is in the aggregation, in the order; but the aggregation is but feeble. This phalanx of columns, this architectural republic, is not yet united and closed by one arch. In Greek art, as in Greek society, the connecting link is imperfect. The Etruscan and Roman world was more united. So also was Italian architecture. Here the arcade reappears; it joins above, and the arched roof closes. In other words, aggregation is strengthened, and upward aspiration tends to reappear. As with art, so with society. Here is a social hierarchy and a magnificent power of association. The metropolis protects the colonies, however remote they may be from the city. As the symbol of such a world the column does not suffice, nor even the arch. See the monuments of Trèves and Nîmes with their double and triple stories of arches and porticos; but all this will not be enough to represent that which is yet to come. The East has given

nature, Greece the city, Rome the city of right. The West and the North will make of this the City of God.

We know that the Christian Church was originally but the basilica of the Roman tribunal. The Church possessed herself of the identical pretorium in which Rome condemned her. The Divine City invaded the judicial city. Here the advocate is the priest and the pretor God; the tribunal becomes enlarged, rounded, and forms the choir. This Church, like the Roman city, is yet restricted, exclusive; she does not include the whole; she pretends to mystery, and insists on initiation; she still is enamoured of the dark catacombs in which she had her birth; she still digs for herself vast crypts, which remind her of her cradle. The catechumens are not yet admitted into the sacred edifice, they are still doomed to wait at the gate; the baptistry is without, so is the cemetery, the belfry the same; the organ and the voice of the Church are raised by her side. The ponderous Roman arcade seals up with its weight the subterranean Church buried in her mysteries. Things continue thus during the Church's conflict; the tempest of pagan invasion must pass away before the Christian world can believe in its own duration. The year 1000 was universally believed by the Christians to be the term of the world's existence; not, therefore, until this portentous era was passed was any notable attempt made for the construction of Christian temples in which the sublime, the beautiful, and the permanent should be harmoniously blended. But the year 1000 is no sooner passed than the Church acquires faith in the world's duration, and a perception of its own unity. Then it begins to shake off its narrow garb; it dilates to embrace the world, and emerges from its gloomy crypts. It mounts, it lifts up its arched roofs, and rears them in defiant crests, and in the Roman arcade reappears the Oriental ogive.

The Roman hierarchy piled arcade on arcade; the sacerdotal hierarchy piled ogive on ogive, pyramid on pyramid, temple on temple, city on city. The temple, the city itself, is here no more than an element; the Christian world contains all preceding worlds, the Christian temple contains all other temples; the Greek column is there, but colossal, and exfoliated into a sheaf of gigantic sub-columns; the Roman arch reappears, but under a form at once bolder and stronger; in the spire the Egyptian obelisk reappears, but mounted on a temple; on the counterforts stand the figures of angels and prophets seeming to proclaim prayer to the four winds, like the Imauns on the minarets; the flying buttresses that ascend to the roof of the nave, with their light balustrades, their radiating wheels, and denticulated points, seem like Jacob's ladder or that narrow bridge of the Persians over which souls are obliged to pass the gulf, at the risk of losing their equilibrium by the burden of their sins. Here, then, is the Christian Church, which, as soon as it had emerged from the darkness of the catacomb and the mysterious crypt in which the heathen had confined it, lifted that crypt towards the sky. Deep as it had descended, it now soared aloft; the flame-like spire escaped like a deep sigh from a heart oppressed for a thousand years.

So strong was this respiration, so vigorously beat that heart of mankind, that it forced its way to the light through all parts of its covering, and burst forth in the ardour of love to encounter the glance of God.*

So much for the principle and generation of Gothic or Pointed architecture. Its development and decadence will form the subject of a future paper.

STUDIES OF MODERN ARCHITECTURE AT HOME AND ABROAD.

No. III.

BY G. R. BURNELL, ESQ.

THE power of the French nation to influence the intellectual movement of the rest of the Neo-Latin races of Western Europe, is one of the strangest phenomena of modern times; and however it may be explained, on whatever faculty it may depend, the fact is still that, of late years, every great modification in the modes of expression of man's higher aspirations discernible amongst them, has originated amongst that gifted nation. Certainly the change which has come, in so marked a manner, over the various branches of the fine arts since 1848, must be connected directly or indirectly with the events which have taken place in France during that period, whether the tendency of those events be for good or for evil; and at no previous period of her history could France boast with greater truth that she was the heart of Europe. Both politically and morally, it seems to us that there is danger in this tendency to imitate a nation which has bartered freedom for ambition, and has confessed that it is unable to support any long-continued effort of abnegation, or of contention with the principles of disorder implanted in every form of society. But the splendour of some of the artistical works lately executed in France has dazzled so many able and conscientious men, that it is essential to examine narrowly the tendency of the principles on which they were undertaken, and the influence of those principles upon the æsthetical faculties of the age, both as regards their actual and their eventual effects.

It is not our province here to examine the causes of the sudden explosion of public contempt under which the Government of Louis Philippe passed away, without resistance, without dignity, and almost without regret. Never did a great revolution occur in a more unexpected manner, or apparently with so little reason; but as all these great social problems must have their origin in some deep-seated feelings of the human race, it may fairly be suspected that this particular problem of the cause of the revolution of 1848 had some connexion with the reaction against the demoralizing tendencies of the Government of the Orleans branch, which, as was before observed, had displayed themselves even in the architectural taste of the buildings in the new quarters of Paris. On the outburst of the revolution of '48, all building operations, however, were for a time suspended; and the disturbance produced

by this event in the political affairs of the world was so great as to cause this effect to be felt in almost every country of Europe. A stable form of government slowly, and in the midst of great opposition, rose from the chaos of the commencement of the year, under the direction of the moderate Republicans at first, and then under that of the Bonapartists. Both these parties seem to have felt that their safety depended on keeping the building operatives of the capital fully employed; and, in their turns, they respectively adopted energetic measures to revive the activity of those branches of trade by undertaking extensive public works, and by encouraging the construction of private dwellings. When the Prince President had consolidated his power, and in 1851 had finally overthrown the Republican form of government, he entered more energetically still on this course; and without any regard to the cost of the operation, he commenced an entire remodelling of the capital and of the most important provincial towns, in a spirit so singularly like that which led Augustus to convert his "city of brick into a city of marble," that the suspicion naturally arises in the minds of students of history that the measures of despotism must in all ages closely resemble one another. And, indeed, the analogy thus indicated between the external phases of despotic government, as practised by the nephews of the ancient and of the modern Cæsars, may be observed to prevail to some extent in matters of detail, quite as much as in the general system adopted by them in their mode of conducting the general system of public buildings, and in the intervention of the State in this matter. All despotic governments indulge in a taste for building; and the suppression of every exaggerated display of social activity has been accompanied by a great effort on the part of the government to improve the monumental character of its public works. It is easier to control bricks and mortar, and to guide the artistic taste of a nation temporarily, than it is to control the exercise of freedom by the thinking classes; and it cannot, therefore, be a matter of surprise that it should be the object of those who represent the principles of compression, to turn the attention of their subjects to the practical questions connected with building, in order to divert them from the investigation of the questions connected with political or moral subjects.

Be this as it may, the alterations of the principal cities of France, subsequently to 1849, have given rise to a European movement of the same description, and there are few cities in which an attempt has not been made to remedy the defects of distribution, or to improve the artistic character of the architecture: even in Holland projects for this purpose have been prepared. As a general rule, on the Continent, the designs for the new streets have been prepared with a view to facilitate the movements of troops in the interior of the towns, and to render street fighting more difficult to the mob than it formerly was in the midst of the narrow, tortuous streets of the middle ages. The first operation of the French Government was, indeed, to form a wide street through the centre of Paris, from east to west, and to throw open the buildings of the

* "Histoire de France," par M. Michelet, livre iv. pp. 668 et seq.

Hôtel de Ville; and it was only after this strategical route was completed, that the various boulevards and streets running north and south were attempted. The effect of these various alterations in allowing air and light to obtain access to the old quarters of Paris, has been so important in its action upon the rate of mortality of the inhabitants, that there would be little good in questioning the propriety of the course so adopted, if it had not been for the fact that, in order to secure the rapid execution of the plan on which those alterations were based, the Emperor had thought fit to adopt a new municipal organization, which has left individuals even less scope for the exercise of their own taste than they had previously enjoyed under the centralized administration of the Constitutional Monarchy. It is true, that of late years the powers of interference of the *Conseil des Batimens Civils* have been greatly diminished; but as, at the same time, the powers of the Municipal Council and of the Prefect of the Seine have been more than proportionally increased, the architecture of the houses upon the new lines of streets has assumed a more decided uniformity than had formerly prevailed. All the elevations are submitted to the approval of the authorities of the Hôtel de Ville; and the consequence is, that there is about as much "character" in the street architecture of the period of the second Empire as there is about a regiment on parade; and, moreover, the tendency of the whole social system of our neighbours acts directly to increase the external uniformity of their buildings. For the absence of large fortunes, the gradual levelling of conditions (resulting from the subdivision of property under the provisions of that fearful mistake, the *Code Napoleon*), renders the plans and distribution of town houses necessarily alike; and the fact that nearly all houses in France are built upon freehold land acts in the same direction, by rendering it important for the builder to crowd as many lodgings as possible upon the same surface area. If it were not for the occurrence of the numerous public offices and buildings of French towns, the monotony of their modern street architecture would, indeed, be unbearable; and even with that adventitious aid there is a sad lack of movement and variety; there is, so to speak, an absence of individuality, which is almost painful to those who have been educated under a system of liberty, as opposed in its results to a system of equality under a strong military government.

The political and moral causes thus referred to have extended their influence even to the details of the buildings recently executed in the great French towns. The architects cannot think freely or indulge their own genius, when they know that their designs have to be submitted to a body of men of preconceived tastes and opinions, and who notoriously are intolerant of what they designate "irregularities." At the present day, then, it will be found that the style of architecture which was originated by M. Duban, and carried forward by Messrs. Vandoyer, Labrousse, Laval, Questel, Cendrier, &c., reigns with what may be called tyrannical sway; and the majority of the new houses, and far too many of the public buildings, are erected upon designs conceived upon the principles

thus displayed. The characteristics of this school are a feebleness of general handling; a want of pictorial effect; a prodigal use of mouldings of extremely flat profiles, and of incised or intaglio ornament; breaks over pilasters and in the midst of pediments, which are in nowise explained by, or called for in consequence of, the construction itself; in a word, they may be described to be a series of violations of the laws of logic and of optics, as derived from the practice and study of the greatest architects of the world. Such a style never could have become national, had not a very strong central administration imposed it upon the public; and one of the most grievous sins against taste committed by the present government of France is to be found precisely in the favour with which it has treated a school of art based upon such mistaken principles. The Bibliothèque St. Génévieve, the church of St. Eugène, the Asile of Vincennes, the Salle des Ventes des Commissaires Priseurs, the new buildings of the Conservatoire des Arts et Métiers, the Halles Centrales de Paris, &c., may be referred to as illustrations of this debased style, which unfortunately is being copied in nearly all the provincial towns of France, and in the countries which blindly follow her fashions.

The explanation of the growth and favour of this style is to be found, we think, firstly, in the lower moral tone of society produced by the corruption of the Orleans government, and the still more corrupt and debasing tyranny of the Imperial régime; and secondly, in the exclusive cultivation by the professors of the fine arts of the means of mechanical execution, in contradistinction to the study of the principles of art. "Quand notre merite baisse, notre gout baisse aussi," said de la Rochefoucault; and it cannot be matter for surprise that the nation which is content to accept rest at the price of its liberty, should also forget to study the arduous problems to be met with in the search for ideal beauty, for they must require earnest and persevering attention of the same kind as is required for the study of the problems of the exercise of freedom. The existing state of the French literature throws in this respect a strange reflex light on what is passing in the world of art; for the writers of the present day have adopted a style which "tells" more upon the eye than it does on the ear or on the judgment—a style, in fact, which has been aptly compared to the effect of light traversing a number of prismatic surfaces kept in constant motion. Thought is decomposed, as it were, but there is no depth or harmony of colour in the images thus transmitted; and, indeed, it is only in the recent writings of the men who had already achieved fame and position under the Restoration itself, or under Louis Philippe, that we can discover any traces of the former intellectual grandeur of France. Guizot, De Villemain, De Barante, Cousin, J. Simon, S. de Sacy, A. Thierry, Amédée Thierry, V. Hugo, St. Beuve, De Lamartine, d'Hauranne, Carné, De Tocqueville, De Montalembert, Parradol, Rénan, Albert de Broglie, Quinet, Michelet, &c., the true thinkers of France, are men of other times, and they contrast strangely with the La Guerronnière, Gachain, Taine, Caro, Cassagnac, C. Nisard, O. Feuillet, Aulagnier,

Dumas fils, Champfleuri, T. Gautier, A. Houssaye, &c., of the governing school. In the decidedly recent times, the most vigorous writings in the French language have even been produced in Switzerland and in Belgium; and it is only in those countries, still free from the iron rule of military despotism, that writers in French dare to handle the grave questions of man's rights and duties with the grasp of intellect to be found in the writings of Bungeur, Castel, De Pressensé, De Gasparin, D'Aubigné, Laurent, De Rougemont, Pictet, Trotet, &c. The physical sciences have not suffered in France under the present Empire, it is true, any more than they did under the first Napoleon; but their cultivation is no indication of the moral value of a national mind, for their excellence is in nowise connected with the noblest faculties of our race; nay, rather, it is perfectly consistent with an absence of moral worth. It was well said by Joubert, that "abstract studies, or those which are addressed more to the intellect than to the sentiments, narrowed, even if they sharpened, the mind;" and the unseemly disputes between MM. Leverier and Delaunay, Frémy and Carron, do not argue well for those humanizing effects of pure science without which it is in vain to hope for a display of forms of art able to appeal to the universal feelings of man. And thus perhaps it is that mechanical execution has been of late years more developed in France than artistic feeling has been; that engineering has made more progress than architecture; whilst, on the other hand, painting and sculpture have, in that country, assumed the same character of effeminate, morbid refinement which is to be observed in the buildings recently erected. The engineers themselves have not escaped the deleterious influence of the moral atmosphere in which they live; and the affected prettiness, the misplaced, illogical ornamentation and frittered outlines of such works as the proposed cast-iron towers for the Artesian wells of Passy and of Grenelle, the Ponts d'Arcole, de Solferino, d'Alma, the Lyons and Western railway stations, the Vincennes railway, &c., prove that even these men of science have lost the feeling for the superior dignity of simplicity and repose.

The state of architecture in England, and in the other constitutional States of Europe, points the moral of this tale of the depressing influence of a form of government opposed to the free discussion of political and moral problems. London has not been transformed as though by magic, it is true, and the centre of our metropolis is still a very irregular, inconvenient, and ill-distributed mass of houses; but the old memories, the glorious traditions of the past, have not been ruthlessly swept aside; the finances of the present and of the future have not been recklessly burthened, and the labouring classes have not been taught to look to the State to remedy the effects of every temporary pressure; whilst, so far as regards the interests of art, we have been left to display our individual tastes as freely as could be desired. The effect has been, that in those parts of London where great alterations have been made, as in Cannon, Fenchurch, Broad, Threadneedle, and Lombard streets; in Cornhill, Cheap-side, &c.; in the various club-houses, and in the palatial

residences of our nobility, there are to be discerned evidences of deeper and more original thought—a truer perception of the aim and ends of architecture, a more correct taste, and a keener appreciation of the sources of beauty, than in the more ambitious productions of our neighbours. Bridgewater and Holford Houses are as immeasurably superior to the house built for M. Fould, by Labrousse, as the warehouses and offices of Cannon-street are to the endless rows of houses upon the new Boulevards; and the architecture of Manchester, Liverpool, western Yorkshire, Glasgow, and Edinburgh, is as superior to that of Rouen, Lille, Lyons, Marseilles, Strasbourg, and Mulhouse, as it is local and appropriate. Even the prevailing folly of employing polychromatic materials, in a climate which is certain to reduce them to a uniform grey tone within a very short time, argues that our architects entertain opinions of their own, and are able to think for themselves; and again, the preference our nation manifestly displays for the picturesque mediæval over the calmly harmonious classical architecture, proves that we have hitherto kept ourselves free from the excessive cultivation of the analytical method so much in favour with arbitrary governments and with the nations ruled by them. Of course the new English school is liable to criticism, and the new buildings erected here are often, both archæologically and artistically, incorrect; the very originality and freedom of their authors, at times indeed, lead them into offences against the laws of æsthetics. But there is to be discovered, in connexion with these errors, a sincere love of art, an earnest aspiration after ideal beauty, and bolder, larger grasp of intellect than can ever co-exist with the absence of political liberty. Unfortunately, the English engineers have not felt the same artistic influences as our architects, and the most apparent of our recent public works—such as our railways, bridges, docks, &c.—are characterized by an amount of positive ugliness which is actually painful, and which proves that the improvement in the means of practical execution is by no means necessarily connected with the advance of art. The Chepstowe, Albert, Hungerford lattice, the Newcastle High Level, &c., Bridges, are simply hideous as works of art, and they must cause us to regret the absurd separation of the branches of engineering and architecture, which has lately caused the professors of the former to neglect the study of form and colour, whilst it has induced too many of the latter to neglect the study of constructive science. The errors of our school, however, may easily be rectified. The improvement of public taste, going on around us with such giant strides, will infallibly cause our artists to study more and more deeply the principles of their art, and the caprices of the day will pass away as they have arisen. Signs of this movement are already apparent, and the reaction against the romantic school is already making itself felt; and so long as we are spared from a strong government which believes it to be its duty to guide and direct public opinion, we may hope to retain this healthy tone of mind amongst our artists.

It is curious to observe in Belgium the influence of

race on the modern styles of architecture, for the westerly Wallon provinces have adopted the errors of the modern French school, whilst the Flemish provinces have lately revived a form of art left by the Spanish rulers of other times; and the districts bordering upon the Rhenish provinces of Prussia, inhabited by the Neiderduytch race, bear distinct marks of the influence of the Low German school. The new buildings of Brussels are evidently designed upon the principles of the French architecture of the period between 1840 and 1848; those of Antwerp have a distinct local character, heavy and surcharged with ornament, but bold and picturesque, "racy of the soil," and reminding us of Rubens, Vandyke, Jordaens, and of the times of Albert and Isabella; whilst at Liège, Verviers, Namur, the most striking modern buildings present many points of resemblance with those of Cologne, Baden, Trèves. Of course, these remarks are only to be applied in a general sense, because a small kingdom like Belgium cannot retain any very distinct local peculiarities, especially in these days of railway and steamboat travel; and the works of MM. Dumont and Beyaert at Brussels, Demany, Casterman, Van den Boorn at Liège, Thirion at Verviers, are as decidedly composed in the spirit of the artists of Spanish Flanders as are those of M. Dens at Antwerp. The differences in the general characters of architecture in the Belgian towns thus referred to may, however, be distinctly traced, and they certainly add much to the interest of the towns themselves. With the exception of the section of architects who follow the traces of M. Roelandts in his caricatures of mediæval art, the Belgian school of the present day seems to be in the right path; and the English architectural student would find much valuable matter in Casterman's *Parallèle des Maisons*, &c. As frequent allusions have been made in these studies to the connexion between literature and the arts, it may not be out of place here to observe that the revival of the Hispano-Flemish style has coincided with the revival of Flemish literature, under Conscience, Snuyders, &c.

In Holland nothing of this kind has taken place, and Dutch architecture has remained as devoid of grandeur as it ever was; whilst it has lost even the comfortable individuality it formerly possessed. The new buildings erected at the Hague for the Colonial Office and for the Palais de Justice, the Post Kantoor, the new Societets of Amsterdam and Rotterdam, the sailors' homes, hospitals, and prisons, lately erected in the country, are about as devoid of any pretensions to beauty as it is possible to imagine. The principal reason for this depressed state of architecture in Holland lies in the fact, that the profession of architecture is not there kept distinct from the business of a contractor; and perhaps also in the fact that the climate of that country is not favourable for the display of external art, whilst the building materials at the command of the Dutch architects are both limited in number and of inferior quality. But at all times the æsthetic qualities of the Dutch have been markedly different from those of their Belgian neighbours, and they seem to have been influenced not only by the physical conditions of their

country, but also by the religious and political organizations under which they have been developed. Holland has not produced any great historical painter; nor has she ever produced any grand architectural monuments. Her art has always been *bourgeois* and "of the earth, earthy," perhaps because in the historical period she has not had any distinct aristocratic class; and, it may be, because the form of Protestantism she has adopted—the Calvinistic one—is opposed to the cultivation of the higher class of art—viz., the one devoted to the service of religion. Nevertheless, in the sixteenth and seventeenth centuries there did exist in Holland a style of architecture peculiar to, and characteristic of, the country; this disappeared about the period of the emigration succeeding the revocation of the Edict of Nantes; and since the commencement of the eighteenth century, the Dutch architects have contented themselves with tame reproductions of French or of German types, without making any attempts to solve for themselves the various problems connected with architectural expression. Even the period of prosperity Holland has enjoyed since 1848, when the rest of Europe has been disturbed by the Russian and Austrian wars, &c., has been powerless to rouse her from this state of intellectual torpor; and the Dutch continue to merit the nickname, so often applied to them, of "the Chinese of Europe." This is a strange problem, for there is wealth, freedom (both political and moral), and a rather marked tendency on the part of Dutch thinkers to enter upon abstract psychological investigations in a fearless manner. Does the national love for the useful incapacitate the people for an appreciation of the beautiful?

In Germany the most remarkable phenomenon in the world of art observable in the period subsequent to 1848 is the extended influence of the Prussian or North German school, even in Austria and Bavaria, or Southern Germany. The tendency of the Prussian school is mainly the same as that of the English school; that is to say, it is romantic rather than classical, synthetical in its method rather than analytical, following in its choice of means the examples of the Middle Ages, when the Catholic church was all-powerful, rather than those of Greek or Roman polytheism. Still, this similarity is "as with a difference;" for there is a cold, pedantic spirit about the north German architecture of late years, and a worship of school teaching, which deprives its monuments of the spontaneous character requisite for a living art, and which seems to have been produced by the influence of the ubiquitous bureaucracies of that country. In all these discussions upon foreign architecture, it is indeed essential to bear in mind the effect of the powerful centralization of the Governments, which have adopted the system of organization inherent to the imitations of the Roman or codified law. To use a neologism of the day, the power of initiation is, in those countries, almost exclusively confined to the Government; and it is both a tradition and a practice, that the State should guide the education and the great operations of the nation. Professors named by the State from the members of colleges or schools maintained by the State, direct the studies of the young artists or archi-

fects; and the works of the more mature artists are submitted, in all important cases, to the approbation of the various branches of the State administration. Under these circumstances individual character can hardly be expected in the works of the majority of architects; for the number of men of sufficient genius to break down artificial barriers is not great at any time, and in a crowded profession there are necessarily more men of talent than of original genius. Hence it is, that throughout the Continent the prevailing style of the day, in any particular nation, is more closely and generally followed than it is in either England or America; and that there is a more decided absence of local and of personal character in the architectural productions of the former than we are accustomed to meet with in our cities. Nevertheless, the distinction between the North and South, the Protestant and Catholic, schools of Germany is still distinctly perceptible, and the investigation of its nature might lead to the discovery of some important phenomena of the constitution of the æsthetic faculties.

Without dwelling upon this question, it may be desirable to state that the new Russian Embassy at Berlin, by Von Knoblauch, and some of the domestic architecture by Hitzig and by Persius in the same town and in Potsdam, represent very well the present tendencies of the Prussian school. The Railway Station at Munich, by Bürklein; the Commandantur Gebände of Vienna, by Siccardsburg and Van der Nüll; the Greek School, by Haussen; the Jews' Synagogue, and the fine dwelling-houses in the Kingstrasse and Karthner Thor, in the same town, by L. Forster; the Realschulgebände at Brünn, by the same architect; the Bourse of Vienna, the Austrian Lloyd's at Trieste, the Friburg Railway Station, &c., are good samples of the South German school. The mongrel classicism of Von Kleuz, and of the adapters of other styles, employed by King Louis of Bavaria, has fortunately passed away with the well-meaning, but very injudicious monarch himself, and Bavarian architecture is now looking purely German, from neo-classical, as it was. There have been some recent attempts to reproduce mediæval forms, as in the Votive Kirche at Vienna, and the Elizabethan Kirche of Basel; but the tendency of all German architects is towards the revival of Byzantine forms, to which reference has been already made. In works connected with engineering, a very high degree of excellence has been attained by the Germans, and they have avoided the English error of entirely neglecting the study of artistic beauty in these works, or the French error of wasting small ornamentation on them. It would be difficult, indeed, to find any modern instances of bold construction treated with artistic feeling superior to the Cologne, the Dirschau, or the Marienberg bridges; the gigantic viaducts on the Saxo-Bavarian railways; or the more surprising works still on the railway from Vienna to Trieste, across the Soemering Pass; and our engineers would do well to ponder over the lessons thus read to them. The Germans have also of late paid great attention to the construction of theatres, and those erected at Carlsruhe by Hübsche; Mainz, by Moller; Dresden, by Semper; and the one at

Hagenau, prove that careful study is able to solve all the difficulties attending the combination of architectural rules with the requirements of modern habits. The skill displayed also in the construction of the gambling rooms and the baths of the German watering-places is worthy of a passing remark; and in fine, were it not for an evident tendency on the part of the South German architects of late years to seek their models in the existing debased school of France, the state of German architecture must be considered to be highly satisfactory. The only real drawback to its prospects lies in the bureaucratic tendencies of the various Governments; but Continental nations are so used to be kept in leading-strings, that there is no prospect of change in this respect.

Italy and Spain have not done anything of late to indicate that their artists have laboured to discover a form of art characteristic of the moral struggle those nations must be passing through during the period of their revival. Russia borrows her arts and her artists from the older kingdoms of Western Europe, and seems to be but little disposed to work out the germs she possesses of a national style. America (that is to say, Anglo-Norman America) is following the same course, and adopting its civilization and arts ready made from Europe; and so also is Australia, that last marvellous offshoot from our island; whilst our East Indian and Hong-Kong architectures are profiting, it is to be feared, little from the examples of local adaptation with which they are surrounded. The great moral problems connected with art development are, in fact, still being worked out, as they have been for the last three hundred years, in the north-west of Europe; and it is *there* especially that art students should turn their attention, rather than as of yore to the ruins of an effete civilization. Without despising ancient art, it may fairly be a matter of discussion, whether it be not better for the young architect to study in preference to it the living art of our day, especially as the best monuments of antiquity have been so often and so well illustrated. European society is politically and morally in a state of ferment just now; and new habits, modes of thought and action, are strangely modifying the forms of art by which the tendencies and aspirations of man are visibly expressed. New materials are being also constantly introduced which require new modes of handling and new applications; whilst such organizations as the great international exhibitions are bringing nations together in close, but friendly rivalry, in a manner which must eventually exercise an all-important influence upon the future progress of art. Hitherto architecture has gained little by these exhibitions, in a direct manner at least; for the Crystal Palaces of Hyde Park and Sydenham, the Palais de l'Industrie, and the "dish-cover" construction of South Kensington, are all utterly devoid of artistic merit. They have, perhaps, done good in this respect, that they have taught architects "what to avoid;" and also in the further illustration they furnish of the danger of trusting to the taste of State administrations; but the great lesson to be learnt from the whole review of the history of architecture at home and abroad, during the last few years, is that the

first condition for its healthy continuous progress consists in the perfect freedom and the moral worth of the nation in which it is cultivated. No state education, no royal guidance, can ever compensate for the absence of a proper moral tone in the contemporaries of an artist; and whenever a nation loses or abdicates its own dignity and independence, its artistic eminence will soon be lost. The course of events in France during the last few years, and the present state of architecture in that country, prove the correctness of these deductions, and it is precisely on this account that we are disposed to attribute in the future more importance to the English school than it has hitherto enjoyed. The standard of moral worth adopted by a nation is the most infallible criterion of its æsthetical merits; and, alas for France! her standard has latterly sounded the lowest depths of the lower deeps. She has, however, a strange vitality, and an irrepressible love for the true, the beautiful, and the good, so that her moral eclipse cannot be of long duration, but it is very complete just now.

MODERN CHURCH ARCHITECTS.

PUGIN.

WE do not consider Pugin either a great architect or a great man; clever, restless, daring, and impulsive, his short life was spent in a fierce struggle, lit up with many brilliant sparks of genius, and ending at last in the utter wreck of a noble intellect. But, although we cannot place him in the first, he stood very high in the second rank of art reformers, and has left, like some meteor, a noble stream of light in England's horizon.

Everything pertaining to Pugin had force and energy in it, and much was strange and out of the usual order. His first start in life was highly favourable—the son of an artist in good practice and of high reputation, with ample means to educate his son and give him a good position, he was delivered alike from the depressing poverty which damps and destroys so many aspirants to fame, and also from the affluence which engenders idleness, and takes from many the incitement to action. For himself, he was precocious from the cradle. We are not told at what age he walked, but he talked very early, and was a baby dogmatist when he left the nursery. His mother was a strange but clever woman, governing her household with a grim prison-like discipline, and attending the ministry of the late Edward Irving, and listening devoutly to the utterances of the “unknown tongues” on Sundays, and who was complimented by being told that she was very like—the devil; but to the end of her life she was a devout believer in the genius of her son. “If he understood how to dress himself, I should consider him a universal genius,” she said in a letter to a friend, written when young Pugin was thirteen years of age; but this was an accomplishment he never could attain, and he remained a sloven to the end of his life. He was, however, an artist even then, and some sketches of his are preserved that afford sufficient evidence of the wonderful

precocity of the child, and give promise of all that a fond mother could desire.

It is only ten years since Pugin died, and his life is so well known that we have little reason to dwell largely upon it. It had, says Professor Kerr, but three chapters: his youth, his manhood, his eclipse. Measured by the ordinary term of man's probation, it was short, for he died at forty; but into that brief period what a crowd of sensations and endeavours are condensed.

Welby Pugin was born in Store-street, Bedford-square, in 1812, and had begun by 1827 to be an acknowledged artist. Mr. Ferrey has given in his memoir, or rather “recollections” of Pugin, many pleasing incidents of his early life, and several glimpses into the domestic arrangements of his home. Pugin the elder was undoubtedly a worthy, industrious man, as well as a good artist, and did ample justice to the training of his pupils as well as his son. At fifteen, Welby, finding the regular work of his father's office a bore, was picked up by a wealthy silversmith, and employed in designing fashionable Gothic plate. This engagement, although a lucrative one, did not last long, and we find him soon after engaged with an upholsterer, who got hold of him and employed him in designing Gothic furniture for Windsor Castle. Out of this engagement nothing particular arose, except his first grand whim. He was at the age of fifteen, remember, for it is only June, 1827.

Whims are the incentive efforts of genius. There are some people who never get beyond this whimsical stage; perhaps they are to be geniuses in another world; but there are others who get through it early. Pugin was one of these last; he went quickly over the ground, but the whimsicality was stupendous. So now comes whim the first.

At the upholsterer's he met the son of a scene-painter of Covent Garden Theatre. He had never been in a theatre in his life. Then, however, he went behind the scenes, and at once understood all about that. Gothic scenery was fashionable. He made a rush at the subject; studied the processes of painting and machinery, and for some time, as a mere boy, was the great Gothic designer of such things. Not content with this, he cut to pieces the attic story of his old father's house in Great Russell-street, formed it into a theatre of his own, and there revelled in designing (to use the words of Mr. Ferrey) “the most exquisite scenery, with fountains, tricks, traps, drop-scenes, wings, soffites, hilly scenes, flats, open flats, and every magic change of which stage mechanism is capable.” Suffice it to say that he rode his hobby very hard over this pleasant landscape for about two years without drawing rein; then suddenly throwing it on its haunches, with the unceremonious kick of genius, he dismissed it for another whim.

His new passion was the sea. Whether the ocean is a Gothic element in these days, when everything is matter of opinion, might be a question for debate; but Pugin loved it to his dying day. “There is nothing worth living for,” he would say, “but Gothic architecture and a boat!” A sort of Garibaldi in art, he took the command

of a smack, and then of a schooner, and went into trade. At length old Neptune—perceiving, perhaps, that one more foolish young rover was ripe for a lesson—cast him lamentably upon Scottish rocks, and left him half-drowned and half-starved to seek a friend where he might. He made his melancholy way to Edinburgh; went courageously to one of the principal architects, and introduced himself and his misadventure. Gillespie Graham clothed and fed his erratic professional brother joyfully, put a purse in his pocket, and sent him home to London, with a dose of sound Caledonian counsel, and a keepsake whereby to remember it—the good man's silver compasses. All this produced satisfactory results. On his arrival in London the repentant sailor took earnestly to art. Six years afterwards one of the most striking designs for the Palace of Westminster (some said it was the best of all) was Pugin's work in Gillespie Graham's name. In Herbert's portrait, after many years more, Pugin holds in his hands the venerable silver compasses.

The date of this not unfortunate shipwreck was 1830, and the ruined commander had reached the age of eighteen. He now took to art; he took to it, however, still whimsically.

Whim the next was an architectural whim—the establishment of a factory for Gothic carving. He took large premises at Covent Garden; engaged carvers, and undertook the supply of ornamental work for architects in all quarters of the country, making, of course, his own designs of detail, as he alone, even at eighteen, could make them. It seems a hard thing to say, but we are scarcely surprised to be told, that within a few months the speculation proved a total failure.

The idea seems ridiculously natural, but one might fairly say that, amongst all these whims, it is a wonder he had not married. Well, he had married. "I had married," he would tell you, "twice before I had shaved once." It was a short courtship; the young wife came from the scene-painting connexion; she was taken home to old Mr. Pugin's house in Great Russell-street; the parents much disapproved the match, but they did not dare to thwart their wayward son. The poor girl, however, proved an affectionate companion; and when she died, within the year, the boy-husband's heart seemed broken. The desolate youth, in his infinite depression, looked back upon his past life. To smile at his hyperbole would be sacrilege. He was not twenty; he looked back over six years. There had been crowded into those six years—even his stern mother said so—"a whole lifetime of woe." Whim after whim: he resolved to seek out for her burial some pleasant place after the pleasantness of his own odd fancy. He took her to Christchurch, in Hampshire, because it was a pleasant place. Three weeks after her death he laid her in the vault, with unusual ceremonial, at eight o'clock at night. Perhaps it was a comfort, perhaps an embarrassment; she had left behind her the sad legacy of a new-born daughter.

Whim after whim; he was not yet twenty, and we lose their reckoning. He now resolved to build himself a model house. It would seem that he had cherished this

whim for some time, young as he was. He would build in the Mediæval manner, of course—not in the manner which Nash and Wyatt followed, but in what that manner ought to be. He fixed upon a piece of ground near Christchurch, where he had so lately buried his young wife. All was speedily in readiness except one thing—the money.

A few years later the money came, and Pugin built his house, "The Grange," near Canterbury, and an ugly, uncomfortable place it was.

The year 1833 saw Welby Pugin, at the age of twenty-one, an orphan, a widower, a father; one who had seen ups and downs in the world; one who had had his projects, and had some of them still.

He was a slovenly, ordinary-looking person; impatient, dogmatic, and whimsical; sailor-like in dress and habits, with a redeeming dislike, however, of beer and tobacco, and a still more redeeming brightness of enthusiasm in his eye. In all his ups and downs his memory had never ceased to accumulate its stores of Gothic art, and his rare right hand had not forgot its cunning. He now began in earnest the battle of life. It will be seen that his ardour, although all unabated, and still like no one else's ardour, was now the steady purpose of manhood, and no longer the caprice of a boy.

He at once married again. The new connexion was still somewhat hastily and enthusiastically formed; but the lady was one who proved worthy of his respect, and competent to influence him for good throughout the best part of his life.

He went to reside at Salisbury, and became as nearly as possible a man of business,—a practising architect. At first he passed a good deal of his time in Gothic sketching and study, making a tour, indeed, of the English cathedrals for this purpose. He everywhere found restorations, repairs, rearrangements. He disapproved of them. He expressed himself vehemently about them. "I rushed to the cathedral; but, horror! dismay! the villain Wyatt had been there! All that is vile, cunning, and rascally is included in the term Wyatt!" Again,—“The church is in dreadful repair—fall it must; and all that is to be hoped is, that in its fall it may annihilate those whose duty it was to have restored it.” Again,—“The church was improved and beautified about thirty years ago by the late Mr. Wyatt. Yes—this monster of architectural depravity, this pest of cathedral architecture, has been here;—need I say more? The man, I am sorry to say, who executes the repairs of the building was a pupil of the wretch himself, and has imbibed all the vicious propensities of his accursed tutor.” We can only say, that this was, at the worst, very sound criticism, and at the best very rough language. Sound criticism and rough language were to be his through life.

Meanwhile, he had brought out several books illustrative of Gothic art. During the years 1835 and 1836, he published no less than four volumes of designs, in so many various departments of his favourite style—namely, first, his "Gothic Furniture," and succeeding this, his "Iron Work," "Gold and Silver Work," and "Ancient Timber

Work." Although the knowledge of what we call Mediæval principles has vastly progressed since that time, no one who examines those early works can wonder that they attracted great attention, became the accepted authorities on their subjects, and established the reputation of their author as the leader of the new-fashioned Gothic style of ornamental art.

We are indebted for most of the preceding facts to an able lecture on Pugin by Professor Kerr, and regret that we are unable to follow the learned Professor in his estimate of two of the most important points of the artist's life—namely, his value as an art teacher, and the nature of his religious faith—for Pugin had become a Roman Catholic. That his conversion was pure, simple, and sincere—a real surrender of the soul to what appeared to it to be the truth—an act from which all mercenary considerations were banished—is perfectly clear. It is also tolerably clear to us, that such a man will be as intractable in religion as in art. He was the hereditary depository of two very singular natures—the artist father and the fierce, credulous, dogmatic, and fanatical mother; with an innate restlessness that was peculiarly his own. The religious element was nearly as strong in him as the artistic, and both were irrepressible; the art nature was the first developed—he began to sketch when a baby, was an artist at thirteen, and an old man in his profession at twenty-four. He tells us, probably enough, that he did not understand Irving when he attended his ministry with his mother; but in later life he would have known better. We look, therefore, upon his adopting the Church of England in the same light as we regard his upholstery and scene-painting; Roman Catholicism was his yacht; and he died a much better member, except in name, of the Irving—or rather the Catholic Apostolic Church—than of that of Rome. In the community to which he belonged he had become restless and almost maddened by the sad discrepancy which he found between the theory of one perfect and universal Church, whose whole body was a living sacrifice on the altar of God for the redemption of humanity, and the wretched performances which everywhere passed for piety, and but thinly veiled the earthliness of a heart in which the fire of Divine love had long been extinct. He was undoubtedly smitten with the theory, doctrinal and ecclesiastic, of Rome; but he was sadly disappointed when the first flush of the honeymoon excitement had passed away, to find that instead of having united himself to a spotless virgin, he had married a painted old woman of questionable antecedents, and whose face was towards the earth rather than the heavens. In the Church of his mother he would have found things widely different. The Catholic Apostolic Church is young and in the first bloom of its early life. With the credulity of childhood, it unites a child-like simplicity and devotion of the heart. It is not called upon to apologize for the corruption of ages, the tyranny of priests, the slaughter of the innocents. Its history is too short, and its power too limited, to have had any holy wars, Saint Bartholomew massacres, inquisitions, or *auto-da-fés*. With the Roman Catholic Church it was different,

and hence the embarrassment of such men as Pugin when they join that community.

Let no one suppose that we are pleading the cause of Edward Irving, or that we have any particular sympathy with the Church which owes its origin to him; what we wish to imply is, that few people know what it was that Irving really was about. It will surprise many to be told that he attached very little importance indeed to the "unknown tongues." He certainly looked for these and other signs and wonders in the Church, because he looked for the manifestation of the same spirit, and in the same degree, as it was witnessed in the Apostolic ages; hence, what was attempted was a restoration of the primitive Church. His sect had, and still has, a regular order of ecclesiastics, consisting of prophets, apostles, evangelists, and all the minor officers mentioned in the New Testament, who are garnished with all the paraphernalia of the Church, and have no lack of either copes, surplices, or incense. Irving had therefore anticipated Pugin both in the spirit and in the letter, and Puginism and Puseyism are not very good copies of what he was the original. This was our artist's true place, and here he was evidently tending, had not death arrested his progress. As in the natural world kindred particles attract each other, in the world of mind kindred spirits consociate together.

It is impossible to say what Pugin might have attained had he lived to be an old man, and had his mind free from the trammels of Popery; but the domain of art which he selected forbade any surprising achievements, because it dammed up the creative faculty. The wonder is, not that he or any other man should have restored the Gothic style of architecture; the marvel is, that it should ever have been allowed to fall into decay and need a restorer. No man had a keener eye than he for the bad building and patching of Nash and other "architectural wretches;" but when the inventive faculty had to be exercised he was found wanting, so much so that his most devout admirers can only point to one really good and faultless church that he ever built, and that is his own at Ramsgate. The cardinal error of all our ecclesiologists is that they live in the past, and spend the whole of their time in the dead-house; hence their anatomy of monkery is remarkably good. But NATURE might as well have gone out when Protestantism came in, for any particular love that those gentlemen seem to have for her.

Pugin is hardly four-and-twenty, but is established in successful practice at Canterbury, from which he issued a new and novel work. It is the book of a zealot enamoured with his new creed. "It was published by the author at St. Marie's Grange: the book-trade had declined to concern themselves with it. This was the famous 'Contrasts; or, a Parallel between the Architecture of the Fifteenth and Nineteenth Centuries.' It is a book that every one interested in architecture should examine, for both curiosity and profit. The written argument is simple. The Reformation, the author would say, in overthrowing the Mediæval Church, overthrew Mediæval art, which was identified with the Church. Protestantism had done nothing since but 'horrible repairs,' to use his own words,

'alterations and demolitions, directed by a tepid and parsimonious clergy, brutal and jobbing parochial authorities, and ignorant and tasteless operatives.' Modern Classic edifices were but infamous Pagan caricatures; fitness was the test of sound design; real old Gothic work was the only art that would bear this test; it was Christian art; and it was finally and emphatically Roman Catholic art. Beyond a doubt, to a certain extent, this was correct criticism; and if expressed in a temperate manner, it might have been widely, if not universally, accepted. But it was not temperately expressed; indeed, beyond all precedent, the reverse; exaggerated even to such a degree as to lose its very power. The real strength of the essay, however, lay elsewhere: a long series of most clever etchings formed the 'contrasts;' and these certainly produced a sensation. After two or three rather weak and overshot witticisms of delineation at the commencement, he presents, not always honestly, but always most adroitly, one set after another of sketches in pairs. Each pair is formed, of course, on one hand by some example of mediæval design carefully selected for its merits, and on the other by a corresponding specimen of modern design chosen with equal care for its demerits: his style of drawing, moreover, being all in favour of the more picturesque style. The opinion of almost every one was, that these contrasts, although marvellously bold and telling, were in a great measure a failure, through the well-known error of proving too much. That there was great critical truth in them—much really sound comparison—the greatest enemies of his conclusions have always admitted; but the celebrated 'contrasts,' in a word, are a good deal over-contrasted.*

His career for the next five years, although full of successful labour, may be summed up in a very few sentences. His abilities in design, universally recognised, procured him a large practice; but his uncompromising adherence to Romanism kept it confined almost exclusively to the connexion of that communion. At length he found Salisbury inconvenient head-quarters for business; sold St. Marie's Grange for the price of the ground; and in 1841 established his home at Chelsea, being then twenty-nine years of age, and at the very height of his success. Just before the beginning of these five years he had assisted Barry and Gillespie Graham upon their designs for the Houses of Parliament; but otherwise his work was independent, and soon plentiful. As regards literary endeavour, the five years which had opened with the publication of the "Contrasts" were to close with the issue of the equally celebrated "True Principles," he having written nothing of any moment in the interval. As for his habits of life, in spite of the vast amount of professional labour which he accomplished (keeping no assistant, but drawing everything with his own hand), he could still spare time for a good deal of eccentric roaming. As when entering upon practice we saw him rushing from cathedral to cathedral, passionately worshipping the old, and heartily cursing the new; so now, when overwhelmed with engagements, we find him cruising in his yacht upon the open sea for

days together, and occasionally running down the coasts of France and Holland. The merit of the "True Principles of Pointed or Christian Architecture," as the work was entitled, must be allowed to be superior to that of the "Contrasts." Five years of practical experience in life and business had made an improvement in the author. The book of 1836 was flippant in the extreme; it carried an exuberance of sail, and little ballast. The book of 1841 was less pretentious and more safe. The improvement, however, was not so great as in any ordinary case it ought to have been: Pugin was not by any means to be set down yet in the category of sober men. In spite of his subject being now almost purely abstract, he could not help launching out into occasional philippics as fierce to the full as the fire of his younger days could have made them. In spite of the reminiscences of five years of solid work, he could not refrain from exaggerations as weak as ever.

Pugin had not yet learnt that intelligent debate never condescends to deal with sorry misadventures, failures, and caricatures; but, grappling with an opponent's strongest and proudest, by efforts of still greater strength and greater pride, wrestles upon the highest ground at once. Again, the hasty and rude engravings of this work, badly shaded and even badly drawn, were discreditable to an artist who was held in such wide esteem. Nevertheless, the work was successful, and in that early day of modern Gothic deserved to be so.

He lays down two indisputable but novel ideas: 1st. That a building ought to comprehend no features whatever except such as are necessary. 2nd. That all ornamentation ought to be formed by mere enrichment of construction. He pointed out that Greek forms of design being based on wooden structures, the artists of that day erred in using them in stone; whilst the first principle of Pointed architecture, on the other hand, is to disguise nothing and compromise nothing. The underlying sentiment of his life, devotion to artistic ritual, is more fully developed than before. His prayer is that the Church may again, as in days of old, cultivate the talents of her children, to the advancement of religion and the welfare of their own souls; for without such results talents are vain, and the greatest efforts of art sink to the level of abomination. He begins with sound philosophy, and ends with what in any other man we should call cant.

What remains of Pugin's history is short and sad. He lived at Ramsgate, and seemed to be combining in himself the double character of an Augustine monk and a man of business; he was also gradually battling his way out of Popery, and had to endure the social persecution which is reserved for the heretic. One of his books was condemned by ecclesiastical authority, and the publication of another forbidden. In the midst of this his health gave way. In a letter to Mr. Minton, written amidst these cares, he says, "I am dreadfully afflicted in the head." In others he complains of utter prostration. Early in 1851 he betrayed decided signs of insanity. The overwrought brain was chafed and irritated beyond mortal endurance, and he died on the 13th September, 1852, at the age of forty. PEACE BE TO HIS ASHES.

* Professor Kerr.

We can only pause now over his grave, and drop a tear in sympathy with the great and noble heart which always sustained the fierce critic and made all that knew him love him. He was the idol of his parents, his workmen, and all who depended on him. His charity was unbounded; he once astonished the people of Ramsgate by going through the town with a bed and bedding on his back on a Sunday, which he was carrying to a poor, sick, and neglected sailor. He was twice crossed in love, and three times married; and it speaks highly for his social nature that he was happy with all his wives. He loved them all tenderly. On the death of his first wife he scratched on the back of his watch, "This day, March 27th, 1832, my dearest Anne died unto this world, but lived unto God." Such was the short-lived, the gifted WELBY PUGIN.

WHAT IS ARCHITECTURE?

No. II.

BY T. HARRIS, ESQ.

IN a former article we endeavoured to define architecture in what we considered its highest and noblest aspect, and to disassociate the idea from mere building, no matter how admirable in construction and useful in detail any erection may be. What we attempted to impress upon the reader was, that between engineering and architecture there is the same wide difference as there is between mechanical construction and high art. The one is wielding force and striving with the utmost economy of means to attain a definite result; hence, whether it be the construction of an engine or the erection of a shed to keep it in, he disregards all other considerations except fitness or adaptation, and economy or profit. If he can take five hundred people five hundred miles in one day across rivers and bogs, over plains and through mountains, his end is gained, because he has carried them four hundred and eighty miles further than they could have walked. His road must be smooth, his bridges strong, and his tunnels secure. His end is gained in the triumph over nature, by the welding together of forces and combination of various means. The undertaking may be great, the means employed stupendous, and the attainment little short of miraculous; there is immense utility, but no beauty in the whole work. The vocation of the artist is essentially different from all this. With him it is a combination of forms, colours, and proportions, and his end is gained when some ideal type of beauty is produced.

The architectural vice of the present day, as seen in the structures around us, is the want of high art. They exhibit the most ingenious construction; every new invention and appliance is employed, the very best materials are used, and the whole put together with the strictest regard to the office which they are intended to serve, but the whole utterly devoid of every ray of real architectural life. And even when ornamentation is attempted, it is too often a lamentable failure. In such cases the real construction is hidden beneath a shroud of false character, displaying

sham construction of the most impossible and absurd nature, and if we had not faith enough to be assured of its safety, could hardly venture to entrust our lives in the building. Again, in many cases where sham dressings are not resorted to and the true construction is shown, there is a crude form that embodies no thought, and consequently evokes no sympathy, so that we frequently prefer the sham, knowing it to be such, rather than the dry bones that genius hath never clothed with flesh nor animated with spirit.

That we may be perfectly understood upon this matter, let us suggest a few examples to illustrate our meaning. Look at the ceilings of many of our public rooms, take as an instance that of the large and useless hall at the Euston-square Railway Station, and what do we see? A repetition of sham stone panels, enrichments, and beams of the most impossible construction, if really in stone. By the ancient method, when a dome was coffered in stone, we see the object at once and are pleased with the effect, as when the soffits or porticoes are similarly treated; but to have a large space of flat surface treated in this manner is without rational object, and consequently fails in effect. They say it is not to deceive, because every one knows that it is a sham representation, and that there is no stone in it. Why, then, attempt to deceive, and by an unmeaning mass of moulding in plaster produce an effect that is neither grand nor pleasing? A similar instance may be found in St. James's Hall, Piccadilly. On going over the works during their progress, we were led to expect great results. The iron roof exhibited a beautiful combination of arched ribs and bold outlines, and with proper artistic treatment could have been made a marvel of real effect. But what is the result? A sham covering of the most flimsy kind, an endless repetition of canvas for the scene-painter, hiding and disfiguring the whole, and not affording the least indication of the noble construction hidden beneath it. Look again at our exteriors, the last act of despair in Oxford-street; where a factory is dressed up with a sham cement front in imitation of a Grecian temple. Such things are past criticism, though we are never surprised to see them illustrate our architectural journals.

Then, again, if we turn to simple constructive buildings, and take, for example, Captain Fowke's productions at Kensington, on which so much criticism has been employed, and which we are induced out of pity to spare, if it were not for the sake of example. What do we see?—constructive skill of the best kind, in all its crudity, plainly and clearly exhibited. But why with such skill is the result so unsatisfactory? Simply because of the absence of the higher qualities of art; a thorough want of refinement and poetry; columns lined out and with sham capitals and cornices stuck on the top, give a false character, and are unnecessary; wall spaces panelled out in paint and covered with ornament and gilding as inappropriate as can well be imagined, destroy all composure, by giving a disjointed and trashy effect to that which, of all other qualities, required all the quietude and rest that could be obtained, in order to relieve the lightness of

the construction. Now the question is—How comes it that we submit to such absurdities? Is it that we have no living art? No! every age has its own vital characteristic in art, but it may lie dormant for long for the want of energy to awaken it. The precious treasure lies deep in the heart of many, but is encased with the prejudice of association. Numbers feel that such things ought not to be; they are even annoyed at their own inconsistency, but for the want of nerve and faith have not the courage to shake off entirely the old trammels, and stand out boldly in defence of what they know to be right, but content themselves with that false policy of doing all they can without violating the popular prejudice, and quiet their conscience with the false hope, that when they get position and power they will then become the Luthers of their profession; forgetting the old adage, How hard is it for them to do good who are accustomed to do evil. Their position being made, they then have not the stimulus for grand original designs, and time has conformed them to the world and blunted their perceptions and finer feelings. No; reform is not to be achieved in this way, and such half-professors are the worst enemies to true reformation. What is necessary is a bold confession of our wants, a firm and unflinching opposition to prejudice, and a stanch and resolute avowal of the true principles of art. A true architect in love with his profession will shrink from any position that requires him to compromise his love of art for art's sake. What we require is more real workers, who will sacrifice position for the true, rather than gain honour by pandering to the false. Fortunately, our martyrdoms are not very formidable affairs; the morbidly sensitive will wince under ridicule and whine when their genius is not appreciated; but calm, earnest resolution is proof against the sneers "which patient merit from the unworthy takes," is content to scatter the seeds of truth, and in due time reap the harvest of honour.

In applying these remarks to Victorian Architecture, by which we always mean the architecture of our own age, our first demand is, that our buildings should give to the spirit of our times its form and pressure. We have two spectres that meet us everywhere, under the names of Grecian and Gothic; who will deliver us from them? Grecian art is beautiful, because it embodies the genius of Greece. Gothic architecture is noble, grand, magnificent, because it towers heavenward, like the thought in which it originated, and rising on slender columns, points us to the skies. But we who are neither Greeks nor Saracens may certainly hope that the time will come when the genius of England shall be embodied in temples worthy of a great people. We rival Homer and Dante in our poetry; Plato and the schoolmen in philosophy; may we not hope that the time will come when we shall have an architecture as original and fresh, and expressive of the mind of England, as are the poetry of Shakspeare and the philosophy of Bacon?

A memorial to the late Prince Consort is about to be raised, and subscriptions amounting to several thousand pounds have already been subscribed, in order to build a County of Surrey Hospital at Guildford, adjacent to the town. Earl Onslow has given the site.

COLONIAL TIMBER FOR BUILDING AND ORNAMENTAL PURPOSES.

THROUGH wood man first had iron; through iron he has wood. With wood the ore was smelted, and of the smelted ore were forged the axe and the hatchet. And from the earliest days iron and wood have contended which shall be the most serviceable to man. Iron supplies arms, tools, and buildings; but it does not, and never can, supersede wood and timber for the latter purpose. We have "ironsides," and even iron churches; but we must still have internal fittings of wood. In any climate a mere structure of iron, from its being an excellent conductor of heat, would be intolerable. It would blister us in the heats of summer, and numb us in the colds of winter. An abundant supply of timber is therefore as essential to human comfort and wellbeing, viewed in one light, as iron is, viewed in another; and a forest of good timber is as much to be prized as a mine of iron—more than a mine of gold. With an increase of population there must, as a rule, be an increase of habitations, and with the progress of taste and civilization these habitations must be of a better order than were those which satisfied our ancestors. To be of a better order, wood must enter largely into their structure, for the sake of strength, comfort, and ornament; and as our own country is inadequate to supply our daily wants of wood and timber for house and ship-building, for cabinet work, and the thousands of purposes to which wood and timber are applied, it is well to look into the sources of our present supplies at home and abroad, and especially into what supplies we may hope to have in future from our colonies.

Previously to the discovery of the New World, the Old World had to depend upon its native forests for a supply of timber, and there are still countries, as those of Northern Europe, which have sufficient area of forest to supply their own wants and to export to the stranger; but for about a century England has had less to depend for her supplies of timber from Norway and the coasts of the Baltic, drawing much of them from her colonies, especially the British Colonies of North America, which abound in exhaustless forests of timber trees, which can be applied to numerous building purposes. In early times, our best houses in town and country were built almost entirely of native timber, and in old manor-houses may still be seen the vast oaken beam, the chestnut rafter, the dark wainscoting, and the walnut fittings, all from trees felled on English soil. Timber was less costly in many districts than brick or stone; it was not so fragile as the latter, and was easier to transport. A house built entirely of wood had this disadvantage, when built contiguous to others, that through ignition it injured its neighbours right and left, or it was a prey to accident of fire in the premises of a neighbour. The great fire of London, in 1666, was a terrible instance of the danger to which dwelling-houses are exposed constructed entirely of timber. With the growth of nations and the increase of wealth, timber is used as little as possible for building

purposes. Brick and stone are now chiefly employed for outer walls; iron girders in warehouses and magazines take the place of wooden joists; but for internal purposes, in domestic dwellings, wood and timber, on account of economy and comfort, must still be employed to a great extent. We purpose to take a survey of the woods used for building purposes, and next of those for ornamental purposes, natives to our soil, or which are imported from, or to be found in, our colonial possessions and our Indian Empire.

We give the place of honour to the oak, which from time immemorial has been used in England for building purposes. There is no occasion to give a scientific description of the oak-tree, or to expatiate on its many excellent qualities. Perhaps the best oak in the whole world is indigenous to England. In early times it predominated in our forests over all other timber trees. So abundant was it in the time of William the Conqueror, that the woods were not valued according to the quantity standing in them, nor according to the quantity which might be annually felled. Their worth, in fact, was estimated by the number of swine which could be supported by the acorns. This was likely to be the case in a rude age when tools were wanting to cut down and fashion the rough timber; but for centuries the English oak was employed in the construction of houses and ships, and "hearts of oak" is a measure in popular English song and poesy. Even in these days of iron the timber of the oak-tree cannot be dispensed with. The demand is not so great as in the days of wooden navies, and in the days of great beams, when the sawing-machine was unknown. The inspection of any old London house will show what waste of oak timber there must have been from the want of mechanical contrivances to reduce its obduracy to the rules of architectural propriety. England, which was once a huge forest, and where the oak was the principal tree, has been pretty well cleared of this kind of timber in the course of a thousand years. It is now kept growing to preserve the beauty of the ancestral park chiefly. Were a sudden demand to be made upon our native resources, for naval purposes, it could no doubt be met. An Englishman will sacrifice to patriotism his most loved possessions; but the extremity has not yet arrived, and while we have possession of the open sea and our possessions abroad, we can always have a supply of timber for naval and building purposes generally, to save the necessity of our cutting down our old oak trees. We have been rather improvident as it respects our native forests, and there are large tracts of Crown land available for the purpose of growing timber, but sufficient attention has not been paid to planting them. We can still grow good oak timber in England; but as every day we receive from our colonies a sufficient substitute for it, it is possible that oak-planting on a large scale will never more be attempted in this country. The increase of population has rendered the land too valuable to permit it ever again to be appropriated to forests. The seventh Report of the Commissioners of Lands Revenue states the extent of the land in which timber belongs to the Crown in each of the forests to be:—

	A.	B.	P.
New Forest	66,942	3	26
Dean	23,015	3	29
Aliceholt and Woolmer	8,694	1	31
Whittlewood	4,850	3	32
Salsey	1,847	0	23
Whichwood	3,709	3	5
Waltham	3,273	3	2
Sherwood	1,466	3	10
Bere	926	2	13
Sulehay Walk, in Rockingham Forest	860	3	23
	115,594	0	34

"Of which total quantity," says the Report, "about 70,000 acres are fit for the growth of oak timber." The Report proceeds to say: "If 700 acres, or $\frac{1}{100}$, were enclosed and planted every year, until the whole 70,000 acres shall be completed, they will, if kept under proper management, furnish a perpetual supply of at least 35,000 loads of oak timber annually, from the time that the first planted trees arrive at 100 years' growth." A hundred years is a long time to wait for the maturity of an oak tree. Three generations must expire before the wood is fit for felling. Half a generation expires, possibly, before the wood is fit to be handled with the tool. The old saw runs to this: It requires a hundred years for an oak to grow; it requires a hundred years to preserve its maturity; it requires a hundred years to decay. From the birth of an oak from the acorn, then, to its good old age, would require a space of three hundred years; but oaks planted on a good soil are longer lived. There is another saw: Five hundred years to live; five hundred years to flourish; five hundred years to decay. There are oaks in England which date from the time of William, the man who came from Normandy, and who "put down" all the Anglo-Saxons with a firm and sensible hand. Why, we should have had our swine subsisting upon acorns, and like our fathers been living in tents and huts, had it not been for the Norman who suggested the idea of cottages instead of pigsties! The Normans knew nothing of soap and water, for then soap was not, but they had an idea of decency. They parted off the family sleeping-rooms from the cow and the pig. They were the first to introduce order into the family. They were far in advance of the Celtic races, where household uncleanness is rather the order. They were far in advance of old Rome. To the Normans we owe our obligations for the use of clean water as a sanitary agent. The Romans boiled their children to death—at least, the use of the Roman bath was an evil, through ignorance of physiological principles.

We were almost forgetting our woodwork. England declines to supply oak for building purposes to any very considerable amount. We must go to Canada, as the easiest market for any great quantity. The oak timber of Canada, however, can never compete with English timber; neither can any timber imported from our colonies compete with that grown on our own soil for ship-building and house-building purposes. It is only recently that we have obtained colonial supplies of oak. About a hundred years ago we imported pine from our colonies, and about the same time we imported the *cimex*,

the "terror by night," which was not previously known in England. Since the days of Columbus we have made other importations, but the best of them have been woods from the dense forest—woods and timbers which will bear the test of the tool of the graver and the axe of the carpenter.

It is not a curious thing, but it is one which will bear investigation, that the indigenous woods of England in durability and excellence are equal to all the woods of the world. We may lose in fineness of grain, but in toughness the woods of England have no equal. Canada produces an oak, and so does India, but except for economical purposes, neither the one nor the other, be its dimensions what it may, under the denomination of "rough timber," come equal to the same denomination of timber in England. Our prejudices are, therefore, all in favour of timber of native growth; but here the supply is so limited, that we are driven to other sources; hence our colonies are invaluable, and we derive more solid comfort and profit from the forests of Canada than from the gold-fields of Cariboo. Three centuries ago, the want of timber was felt in England, and our forefathers having no colonies to depend on, sought to limit the consumption of wood, and regulate its price by various legislative enactments. By an Act passed in 1533, the forests are sought to be preserved. The preamble says: "The decay of timber and wood universally within this realm of England is so great, that unless speedy remedy in that behalf be provided, there is great and manifest likelihood of scarcity and lack as well of timber for building, making and repairing of houses and ships, as also for fuel and firewood." Certain rigid restrictions are imposed on the felling of trees and the sale of wood; but no Act of Parliament could preserve what was doomed to pass away. Our forests have given place to corn-fields, and we obtain from other lands that which our own can no longer supply. From India we have oak, from various British possessions we have timber of the same tree; but in specific gravity and durability they are all inferior to the British oak. Teak has many excellent qualities; we are greatly indebted to it for many building purposes, but British oak has never yet been excelled.

The oak timber imported from America being inferior in every respect to that of the common oak of England, it should never be used where great durability is required. A substitute for oak for shipbuilding purposes is found in teak, or Indian oak, the produce of the *Tectona grandis*, a large forest tree which grows in the dry and elevated districts of India, and in various islands of the Eastern Archipelago. Tredgold and Crawford affirm that teak timber is by far the best in the East; it works easily, and though porous, is strong and durable; it is easily seasoned, and shrinks very little; it is of an oily nature, and therefore does not injure iron. Compared with oak it is equally strong and somewhat more buoyant. Its durability is more uniform and decided, and to ensure that durability it demands less care and preparation, for it may be put in use almost green from the forest, without danger of wet or dry rot. It is suitable for all climates and alternations of climate. The teak of Malabar, produced on the high table-

land of the south of India, is deemed the best of any. It is the closest in its fibre, and contains the largest quantity of oil, being at once the heaviest and the most durable. This teak is chiefly used in shipbuilding, and for the keel and submerged parts of a vessel. It is not at all fit for spars. A specimen of teak was introduced into the Royal Gardens at Kew, about ninety years ago; but from the warmth of the climate of which it is a native, it can never become a forest tree in England. The author of an article on "Vegetable Substances," in the "Library of Entertaining Knowledge," says of teak—"Besides its value as timber, the teak has great beauty as a tree. It is found more than two hundred feet high, and the stem, the branches, and the leaves are all very imposing. On the banks of the river Irrawaddy, in the Birman Empire, the teak forests are unrivalled; and they rise so far over the jungle or brush-wood by which tropical forests are usually rendered impenetrable, that they seem almost as if one forest were raised on gigantic poles over the top of another." East India teak logs cost from four to five shillings the cubic foot. The cubic foot of teak, from the Malabar coast, weighs 37 pounds 14 ounces, and the specific gravity is .606. The teak of Ceylon weighs 47 pounds 3 ounces the cubic foot, and the specific gravity is .755."

Next in importance to the builder after the oak, in modern times, are fir and pine, which we import in large quantities from America; but unfortunately the wood has not come alone, but along with it the terrible legacy of the *cimez*, the "terror by night." From our colonies we had not only bad timber, but noisome housemates. We had cheaper floors, and beds, and chairs; but we had, at the same time, tantalizing, bloodsucking bedfellows. From "Norrawa" came our pines and deals in former times. With oak and Norway firs we built our ships; from Norway we had our masts and spars. The oak of Old England sustained the shock of the bullets of French and Dutch fleets; but the timber—the pines of Norway, Sweden, and Northern Prussia—had to sustain, in masts, yards, and spars, the shock of tempests. We have useful timber-trees for naval and other purposes from British North America, but none on which we can depend for lasting purposes; the timber is of rapid growth; in twenty years a large tree will grow from the seed of a cone. The pine and firs of America are soft, and easily worked by tools; for a variety of purposes, where duration is not an object, they are extremely handy; they are useful to the trunk-maker, but traitors to the builder. Of pines there are some twenty species; they are mostly all evergreens; the colder the situation in which they grow, the harder is the timber. Pine trees, slow of growth, have been found to be firmer in structure, and more useful in every way to the builder, than pines from Canada or any other country where the tree in a few years attains the proper dimensions for building uses. Of the *Pine* family there are three genera—*Pinus*, *Abies*, and *Cedrus*,—and among these many species. Pine appears to belong to the northern regions of the globe. Pine we chiefly import, and it is employed to a large extent in house and ship building, for railway purposes, and where-

ever logs or planks can be used; it is valued for its durability. Pine, however, must at one time have been plentiful in Ireland; and even now we read that the pine found in the bogs of Ireland is of a very superior quality, and used by the inhabitants for many purposes. We have mentioned the inferior quality of Canadian timber; but while it was protected by high duties levied on foreign timber, it was largely imported and largely consumed for building purposes, naval and civil, with often disastrous results. Sir Robert Seppings, one of the commissioners of H.M.'s navy, a man of great experience, stated before a Committee of the House of Lords: "About the year 1796, there were a certain number of frigates built of the fir of the Baltic, and their *average durability* was about EIGHT years. About the year 1812, there was a considerable number of frigates built, also of fir of the growth of North America, and their *average durability* was not HALF that time." He further stated in evidence: "I believe that *the navy has suffered very considerably from the introduction of Canada timber*, or timber of the growth of North America; in consequence, from experience, we have entirely discontinued the use of it, except for deals and masts." Mr. Copland, an extensive builder and timber-merchant, speaking before the same Committee, praised the superior quality of Norwegian, Swedish, Russian, and Prussian timber; and stated of Canadian, that the bulk of it is very inferior in quality and softer in its nature, not so durable, and is *very liable to dry rot*; indeed, it is not allowed by any professional man under Government to be used, nor is it ever used in the best buildings of London. He added: "If you were to lay two planks of American timber upon each other, in the course of a twelvemonth they would have the dry-rot, almost invariably, to a certain extent." This censure applies more directly to the white pine, for the red American pine is allowed to be of a superior quality; and the pine and spruce planks of New Brunswick and Nova Scotia, especially the latter, are universally preferred for the purposes to which they are applied to all other varieties of timber.

From our North American colonies we import annually, besides pine and fir, considerable quantities of elm, ash, and birch. The elm is a noble forest tree, attains a great size, and lives to a great age. Five species are indigenous to England. An elm was felled in 1745, at the upper end of Church-lane, Chelsea, said to have been planted by Queen Elizabeth. It was thirteen feet in circumference at the bottom, and one hundred and ten feet high. Elm, though a tough and strong timber, is very rarely used for architectural purposes. It is coarse and open in the grain, more especially when it has grown upon very rich land. Elm is chiefly used for coarse purposes—casks, coffins, wooden presses, pumps, &c. It is a very durable timber when always under water, and hence is well adapted for piles and planking for wet foundations. It was used for the piles upon which old London Bridge stood. The annual importation from North America is about 150,000 cubic feet.

The importation of ash from the same region is trifling in comparison—perhaps 30,000 cubic feet annually. It is a tree of very rapid growth, and for timber young trees

are preferred to old. It is chiefly used, on account of its toughness and elasticity, for the spokes of wheels, ship-blocks, the teeth of wheels, &c. It is difficult to work, too flexible for building purposes, and is not durable, being liable to the attack of the worm.

The birch is largely imported from British North America, in greater quantities even than red pine. On the average, we import about 350,000 cubic feet of birch annually. The birch delights in a wet soil by the banks of rivers. According to Vitruvius, it furnished the material for the piles upon which the buildings of Ravenna stand. In a dry situation it is unfit for employment, on account of its early rot when exposed to the weather or to mere damp, and its susceptibility of engendering worms. Evelyn says that it was used for the piles upon which the celebrated bridge of the Rialto at Venice was founded in 1591. Birch is excellent wood for the turner. It is sometimes used in the manufacture of herring-barrels.

(To be continued.)

OUR SOLDIERS' HOMES.

It is impossible to deny that this present—the Victorian Age—is an age of wonderful inconsistency and contradiction. We demand virtues in others which we do not ourselves possess, and teach that which we do not ourselves practise. Just at present we are going to ask the inhabitants of the various towns and villages situated on the banks of the Thames above London to be good enough not to deposit their sewage in the river, because we think, and very properly think, that such a practice is in its results very injurious to our health; but then we of the metropolis have for some time past been engaged in the construction of immense works whose sole object is the collection of the whole of the sewage of a vast and densely populated area, and its deposition in the same river Thames—at a point where, it is hoped, it will no longer prove offensive to *us*. There is a good deal said and read about the improvement of the dwellings of the lower classes, but there is no point within the limits of London that is more than five minutes' walk from a street, court, or alley of the foulest, tumble-down, ill-smelling, unventilated, and over-crowded dens that it is possible to conceive of. But it is not these that we propose at present to consider; we must return to them at another time. Our object now is to place before our readers some of the conditions under which the British soldier is housed in England in the Victorian Age—the age of sanitary lectures, and in the presence of Commissions and reports specially directed to the sanitary state of barracks in the United Kingdom.

Some seven or eight years ago a committee was appointed by Lord Panmure to consider the subject of the barrack accommodation which should in future be provided for the army; and in the course of their inquiries they learnt that the accommodation then provided in barracks was generally inadequate both for the comfort and convenience of the soldiers, and for the creation of a

higher tone of social habits amongst them; and while fully recognising the necessity of an economical expenditure of the public money, they expressed a decided opinion that considerations of economy should not be allowed to overbear the demands of a sanitary and moral character, the importance of which, they said, is being every day more fully recognised and acted upon in reference to the class of society from which the privates of the army are generally recruited, and especially at a time when large sums are spent in the improvement of gaols and other correctional establishments.

After taking a large amount of evidence on the subject, the committee agreed to a report, in which they laid down the amount and nature of the accommodation which, in their opinion, should be provided in a barrack calculated for the reception of a thousand men of infantry, and also in one intended for a regiment of cavalry, and then proposed that a competition should be opened for architects to submit designs, embodying their recommendations. For each of these barracks they suggested that a sum of money should be placed at their disposal to enable them to offer for the approved designs premiums large enough to attract the attention and induce the competition of architects of skill and eminence, and proposed that the architect whose plans should be selected as being first in point of merit should be entrusted with the execution of his design. Agreeably with this recommendation, architects were invited to furnish designs; many did so at an enormous aggregate cost; the whole of the designs were publicly exhibited; the prizes were awarded; and for anything we know to the contrary, the selected designs were at once packed up and stored away, and that was the end and result of the famous barrack competition.

Shortly after the Report of the Royal Commission on the Sanitary State of the Army was presented, a Commission was appointed to examine and inquire into the sanitary condition of all barracks and military hospitals in the United Kingdom as regards their position, neighbourhood, construction, drainage, water-supply, lavatories, &c., laundries, baths, kitchens, means of lighting, warming, ventilation, and the amount and character of the accommodation provided for the families of married soldiers. The Commission had also power to order works of improvement and cleansing in each barrack to the extent of 100%. With regard to any works which would exceed that limit, the Commission were to report to the Secretary of State as to the sum actually required. Many works were executed under the direction of the Commission; but the radically defective state of the barrack-buildings, and the consequent large outlay required to convert them into proper habitations, was a fatal obstacle to any general improvement in the construction and planning of those structures.

We have yet to show those who regard but the trim and orderly appearance of a company under arms in what homes they are forced to live, but return for a moment to the report of the previous Commission, which shows that the army was then subject to an excess of mortality over and above that prevailing among males in civil life. The annual deaths among all arms of the service on home

stations was stated to be 17·5 per 1000 per annum, as against 9·2 per 1000, which represent the annual deaths among males of the same ages taken over the town and country population of England and Wales. An analysis of the diseases which had led to this high rate of mortality demonstrated that the excess of deaths was due almost entirely to zymotic diseases, such as fevers, cholera, diarrhoea, and to chest and tubercular diseases, such as consumption, &c. Seven-ninths of the entire mortality among the infantry of the line were found to have arisen from these two classes of diseases; and for each class the mortality among the infantry was shown to be more than double what it is among males of the same ages in civil life.

Briefly, the causes of this frightful mortality are to be found in impure air and impure water.

A regiment and a half of soldiers in the United Kingdom live and sleep, as we have elsewhere shown, in ill-ventilated apartments, with no more cubic space, and sometimes much less, than nine men would have in a room 15 feet square and 10 feet high; such a room would give 250 cubic feet of space to each man, an amount of space that would be somewhat exceeded by a box 7 feet long, 6 feet wide, and 6 feet high; 1335 soldiers thus live and sleep in barrack-rooms; 15,195 men have less than 350 cubic feet; 34,882 men have less than 400 cubic feet each; 65,271 men have less than 500 cubic feet per man; and out of a force of 76,813 men, for whom sleeping accommodation is provided, there are only 4656 men with sleeping-room exceeding 550 cubic feet each, and only 2003 men have an allowance of space exceeding 600 cubic feet; but even this excess is obtained under very unfavourable conditions; and the reader must bear in mind that 600 cubic feet is the very lowest amount of space that should be given to each man in barracks; in hospitals 1200 or 1400 cubic are necessary to ensure a healthy state of the air.

To make matters worse, this overcrowding is not in well-planned, ventilated, and cheerful rooms, but in ill-planned rooms, with defective light and no ventilation, in rooms where the very walls and furniture reek with foul deposits of putrescent organic matter exhaled from the lungs and skin of the men (we will not refer more particularly to the inevitable *tubs*), readily detected by the sense of smell in crowded rooms, and especially in any foul air-flues connected with such rooms. This matter attaches itself to furniture, bedding, floors, walls, and ceilings, which in time it saturates, and can be scraped off and examined: of course, rooms in this condition cannot be effectually purified. Plaster absorbs organic matter, and by this means for some time an unventilated room is kept tolerably healthy; but when, as it does, the plaster becomes saturated, the deposit is on the surface, that absorbed becomes putrid, and the room a hot-bed for the growth of disease; yet soldiers live, sleep, and eat in such rooms—until they go into hospital.

Taking 600 cubic feet of air as the least amount that should be allotted to each man, the deficiency of proper barrack accommodation amounts to over 32 per cent., so that we have houses for two-thirds only of our army at

home, the remaining third being huddled together wherever they can be crowded. Chatham Recruiting Barracks exhibit, perhaps, the worst cases of overcrowding, the space allotted to 100 men being no more than sufficient for 57! As it is a recruiting barrack, young soldiers do not remain more than a few months in it, but its inmates are less healthy than the civil male population at the same ages; catarrhal, pulmonary, and zymotic diseases are the chief causes of sickness at Chatham garrison. During the years 1851-57, 66 per cent. of the deaths arose from consumption, fever, cholera, dysentery, and diarrhoea. In these barracks there are eight rooms containing 104 men, with 247 cubic feet of space per man; fifty-six rooms contain 896 men, with 345 cubic feet each; fifty-four rooms contain 864 men, with 281 cubic feet each; sixteen rooms contain 256 men at 285 feet each; and twenty rooms contain 320 men, who have each 275 cubic feet of space; altogether 1128 men are by regulation crowded into a space sufficient for 600 only. The deficiency of accommodation is least at Woolwich, where 100 men have space sufficient for 79.

The following table is given to show the deficiency of barrack accommodation at the principal stations in the United Kingdom:—

Station.	Deficiency per Cent.
Chatham	43·4
Kilkenny and Birr	40·
Dover	37·
Winchester	36·6
Dublin	33·
Canterbury	32·5
Fermoy	32·4
Athlone	31·
Portsmouth	30·
Limerick	29·
Plymouth and Devonport	27·
Cork	26·6
London	25·7
Manchester District	24·6
Woolwich	21·6

It may be well here to note the usual routine of a soldier's life in barracks. He rises at five o'clock in summer and at six o'clock in winter; at nine he breakfasts, still in his sleeping-room, crowded as we have shown them to be; supposing it to be a wet morning, he must remain in the same room until parade, which lasts from about ten to eleven o'clock; if there is no extraordinary drill after parade, he must either remain in the open air or return to his bedroom until dinner-time; he has his dinner in his bed-room, and may remain there the rest of the day. In fact, from the time he gets up till he goes to bed, with the exception of the time during which he is on duty, he has but one room—that in which he has passed the night—to go to.

Having endeavoured to convey some idea of the overcrowded state of our barracks, which, as stated above, do not contain well-planned, ventilated, and cheerful rooms, we will now see in what kind of buildings it is that nearly 77,000 men are compelled to live; and unfortunately we shall have to show that, as regards the neighbourhood of almost every barrack, its construction, ventilation, warming, drainage, water-supply, ablution, and cooking

accommodation, they are as ill-arranged and as defective as it is possible for them to be.

The greater number of barracks inspected by the Royal Commission were reported by them to be situated in the suburbs of towns, in positions hardly any of which could be said to be unhealthy, while very many of them could not be described as otherwise than healthy. Generally they are somewhat elevated above the neighbouring levels, with sufficient fall for drainage, and sometimes they occupy lofty eminences fully exposed to the winds. These favourable conditions are, however, not those in which barracks in large towns, as London, Portsmouth, Glasgow, Devonport, Manchester, Dublin, Limerick, or Birmingham are found. And in too many instances, barracks which occupy what was once a healthy position, have been rendered unhealthy by the erection in their immediate neighbourhood of streets of houses occupied by the very lowest orders, and a certain class who live only in garrison towns.

Around many town barracks the neighbourhood abounds in nuisances; the closets of adjoining houses have been built up close to the barrack-rooms, high boundary walls obstruct the free circulation of air, and close to Piershill Barrack, Edinburgh, the meadows are systematically irrigated by the sewage of the town. The Guards' Recruiting Barrack at Croydon is situated in a damp hollow, and exposed to winds passing over wet land, a manure manufactory, and pigsties. The building itself was originally used as stables, and scarlet and typhoid fevers have repeatedly prevailed among the recruits. Tilbury Fort is situated in a wet, undrained, marshy district, and whenever it is occupied, a large proportion of the men suffer from intermittent fever, which, when once implanted in the constitution, is one of those diseases most injurious to the efficiency of an army, on account of the frequency with which the disease recurs, even from trivial exciting causes. It is common among the men of the Royal Artillery stationed along the banks of the Thames, no fewer than 120 cases per annum having been received into Woolwich Garrison Hospital from these localities. Sheerness is the site of one of our most important naval arsenals and dockyards, and is generally garrisoned by from 700 to 800 men; its position is most unhealthy, from the vicinity of marshes and undrained land. The town itself lies low, and until lately was entirely without drainage or proper water-supply; the sewage was received into cesspools, and the entire supply of water for the town was derived from two wells, into which sewage matter escaped from the saturated soil. It cannot be matter for surprise that as these evils are still but partially remedied, the average annual admissions into hospital at Sheerness from ague for three years have amounted to 125 per 1000 strength, while the usual proportion of admissions from this disease in the cavalry regiments is 0·55, and in the infantry 2·74 per 1000 strength.

Errors which render it practically impossible for barracks to be healthy are also observable in the general arrangement or block plans. There is a want of simplicity in the plans; lofty buildings are erected close together, or round closed courts, or with deep closed angles; barrack-

rooms are built too close to boundary walls, the space between the rooms and the wall being occupied by latrines, ash-pits, &c.; and almost everywhere is the great fault of concentrating many rooms under one roof, instead of spreading the buildings over the ground in detached blocks of moderate size. These defects are of the utmost importance, as they all tend to prevent the first essential of a healthy dwelling—a free circulation of air both within and without the walls. Instances of these defects are to be found in many barracks; St. George's Barrack, near the National Gallery, consists of a large single block of buildings for 476 men; it is enclosed within lofty walls, and the air is at all ordinary times stagnant within the boundary walls. Hyde Park Cavalry Barracks consist of fourteen blocks of buildings on a long, narrow strip of ground, and so disposed as to form a large court, in which it is almost impossible to have a free circulation of air. If these barracks were fully occupied, the density of population would equal 114,500 per square mile, exclusive of women, children, and horses; there are no back premises, and the refuse and manure are piled up under the windows of the barrack-rooms, which are over the stables; the whole place smells of ammonia, and the Commissioners, in their report, described this as one of the worst cavalry barracks in the United Kingdom; its arrangement, too, is such that it does not admit of material improvement.

Passing across St. James's Park, to the Wellington Barracks, which contain regulation space for 1530 men, giving a density of 326,000 inhabitants per square mile for the built area, being nearly double that of East London, one of the most densely populated town districts in England, the blocks of buildings will be found to be arranged in the "higgledy-piggledy" style, and in such a manner that proper ventilation is impossible. At Portsmouth Clarence Barracks, the buildings entirely surround two closed courts; they are intended to hold 912 men; and the population is equal to 330,000 persons to the square mile. The barracks at Galway are imbedded among buildings of the civil population; but if erected on Salisbury Plain, their plans are so crowded and defective, that they could not be otherwise than unhealthy, with their small narrow courts enclosed by high buildings, and destitute of light and fresh air. Even worse than the Wellington Barracks are the Royal Barracks at Dublin, in which there is regulation space for 1917 men: there are narrow, dark lanes between lofty three and four story buildings, the ground rises rapidly behind the barracks, and the men's rooms on three sides of the cavalry square are over the stables; the barrack rooms in the two largest squares have windows to the outer air only at the back, the side next the court being occupied by long corridors; in these barracks there are rooms in the corners and lower flats of the squares, dark and incapable of ventilation. Linen Hall Barrack, also in Dublin, was an old linen hall; it was leased by the War Department as a temporary reserve barrack, and is enclosed among civil dwellings in one of the worst districts of the city. It has seven or eight small, dark, enclosed courts, and is intended to accommodate 1094 non-commissioned officers and men on an

area of rather over two acres. Hulm Cavalry Barracks are instanced to illustrate the injurious consequences of building barracks too close to the boundary walls. The men's rooms are over the stables, and behind them is a narrow strip of ground, affording no adequate means either for cleanliness or for circulation of air between the barracks and the wall; outside the boundary, on one side, is a lofty cotton mill, which shuts off the ventilation in that direction; and on the other side is a closely-peopled district of houses, the closets and outbuildings of which come close up to the boundary walls, so that at certain times the smell pervades the barrack-rooms.

Leaving the defects of the general grouping of barrack-buildings for a time, we will enter the buildings and see whether the internal planning tends to nullify or to assist the death-promoting arrangements of the block plan. Unhappily, so far from an improved system being observable, matters are even worse, if possible, in-doors; large and small barrack-rooms are placed back to back in long rows, end to end, so that windows can be obtained on one side only; long corridors run throughout a building, either dark and unventilated, between rows of rooms, or covering one external side of a single range of rooms—as in the Royal Barracks at Dublin—or the rooms are dark or damp, or unventilated—everywhere there is one or more conditions prejudicial to health. In the Wellington Barracks, in the barracks in the Tower, at the new Cambridge Barracks, Portsmouth, and at Woolwich, the rooms are placed back to back. In such rooms, when occupied as these are, it is impossible to secure a circulation of air, and to prevent its partial if not entire stagnation. So little have these simple matters been understood, that, knowing the evil, it has been the practice in many barracks where the defect exists to make an opening through the walls dividing the rooms: the only apparent result, however, has been a more effectual mingling of the foul air in adjoining rooms than was formerly effected by the opening of the doors on to an unventilated common staircase. Again, in some cases, as in the new Raglan Barracks at Devonport, and in the new infantry barracks at Aldershot, the evil has been seen, but not so the remedy; for while windows have been placed in opposite walls, it has been in the end instead of in the side walls, so that the rooms being long and narrow, the distance between the windows has been too great, and the rooms are still deficient in light and in ventilation.

Perhaps no finer and more healthy *site* could be found for a barrack than that occupied by the new barracks in Edinburgh Castle; therefore—really it would almost seem so—one of the very worst barracks we have has been erected on it. It has a long internal corridor (somewhat of this shape ) with two short corridors side by side, at right angles to the longer corridor, in the centre, leading to the staircases. Around each side of these corridors, are ranged rooms. The long central corridor has no direct light, and is dark and gloomy, each end being closed by doors. It serves admirably as a dark tunnel of foul air, by which the atmosphere in the whole of the rooms is kept in an equal state of unhealthiness.

Besides this, six of the lower barrack-rooms derive all the light and ventilation they have from deep-sunk areas. Of course, notwithstanding its healthy position, the barrack is unhealthy, and furnishes a large mortality from consumption and fever; troops stationed in it are more than usually liable to attacks of small-pox. At Brighton infantry and some other barracks, it would seem that the necessity for providing means of access to the upper floors did not occur to those engaged in their erection until the work was finished, for we find narrow, incommodious staircases boxed off from the rooms, blocking up windows and obstructing light and ventilation. Underground barrack-rooms are not unknown; they occur at Woolwich, Waterford, Edinburgh, and in the new barracks at Gosport. The designers would scarcely contend that rooms below the ground level can be made healthy dwellings. Linen Hall Barrack, before referred to, contains 128 rooms, or cells, without sufficient light or ventilation, the whole internal arrangement being of the most complicated character. There are only *five* fireplaces in the whole building, and there is no fireplace whatever in the hospital. Stoves are placed in the passages, and they are so constructed that they fill the rooms and passages with smoke. This is an instance of buildings erected for other purposes being converted into barracks, and is not a solitary example. In the same city, Dublin, Arbour-hill Barrack was once a prison, and as such was not fit for prisoners. It now accommodates ninety-one men. No inspector of prisons would sanction its conversion to its former use. Fort Elizabeth, at Cork, was a French prison; it is now intended for 180 men, but is not good enough to serve its former purpose. At Stirling Castle the old halls of the palace have been converted into barrack-rooms, by constructing galleries round the walls to accommodate two tiers of men, one on the floor and the other on the gallery, where they lie as if packed away on a shelf above the tops of the windows, so that the only air they have to breathe, there being no outlet from the ceiling, is that which rises after having been exhaled by the tier of men below. At Perth, a manufactory has been easily converted into a barrack, by simply placing some bedsteads on the floor. With regard to everything else necessary, there is "entire deficiency." These are some of the defects which characterize by far the larger proportion of barracks in the United Kingdom, as regards the internal planning; and we cannot but agree with the Royal Commissioners, who considered that the defective plan and structure of barracks all proceeded from one cause—namely, that nobody seems to have considered what conditions are required for preserving the healthiness of a building in which a number of adults must necessarily be massed together within a circumscribed space, and, consequently, no intelligent, uniform plan of constructing barracks has been arrived at; no fundamental principles are recognised as absolutely necessary for health. Some barracks are better than others, and a few are good so far as their general plan is concerned; but these are the exceptions which prove the rule. It does not seem to have been known that the block plan of a barrack, or indeed any building intended

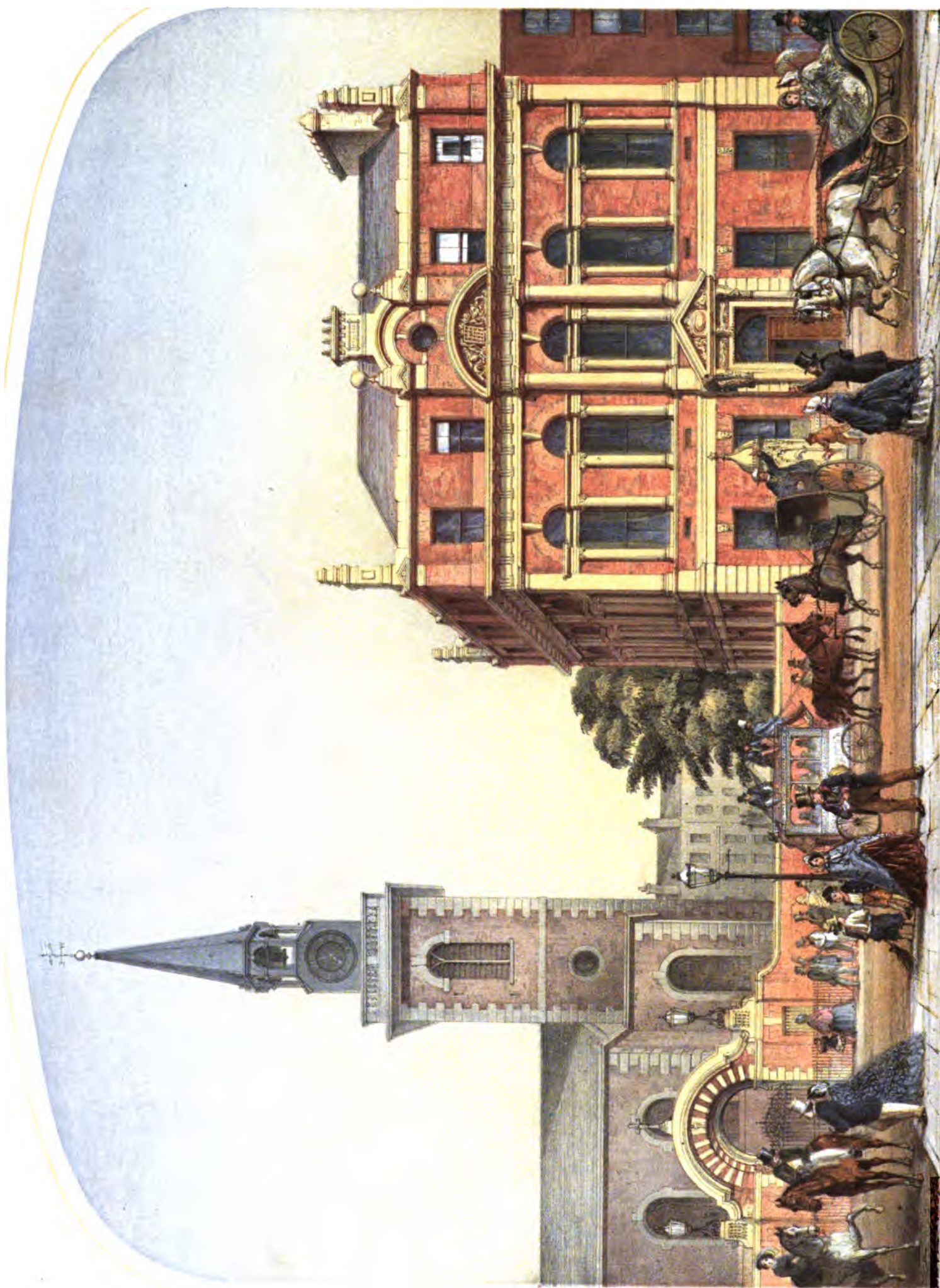
to be occupied by a large number of people, should be as simple as possible; that the largest possible proportion of its surface should be exposed to the sun and air, and that there should therefore be no closed court or angles, and that the latrines, &c., should be placed away and entirely detached from the habitable portion of the establishment.

The non-commissioned officers, and the married men with their wives and children, are numerically classes of considerable importance; yet it is most rare to find any proper or adequate accommodation provided for them in barracks. Generally, privacy is afforded to non-commissioned officers by boxing off a small portion of the men's barrack-rooms. The apartment so obtained is called a *bunk*. It is usually in a corner of the room, and if there happens to be a window there, the bunk is placed before it, and the barrack-room is in that manner in many instances at once deprived of half its light and ventilation; but sometimes, when there is no window that can be appropriated for the purpose, the bunk is dark, and can only exchange air with the barrack-room.

With regard to married soldiers, the present regulation number is 6 per cent. of the strength, so that every regiment of 1000 men will have 60 women and probably from 70 to 80 children with it, and this number excludes women and children of marriages not sanctioned. It is considered one of the greatest difficulties in the army at the present time, how to provide quarters for these families, and the difficulty results in a system at once unhealthy and demoralizing to the last degree. If the married men and their families do not, as is often the case, sleep in the men's barrack-room, they have not generally separate apartments. At Birr Barrack seven rooms were occupied by 21 men, 21 women, and 33 children; the best screen being a shawl or a coverlid thrown over a cord. This practice may now, or might a short time ago, be seen in the Knightsbridge Barracks. But there are many barracks where there is not the shadow of decency preserved, and married people occupy beds in the men's barrack-room without even an old shawl hung up as a screen. At Chatham Barracks not long since (and there may be now), there was a married man with his wife in every barrack-room among the men; and not unfrequently girls from fourteen to sixteen years of age were thus accommodated.

It is satisfactory, however, to find, that so far as possible, commanding officers are ready to do what they can to mitigate this evil, which the defective construction of barracks renders impossible to be wholly obviated. Government now provides a specific sum for providing separate quarters for married men whose pay will not admit of their hiring lodgings; and at least one prominent defect in our barrack system seems to stand some chance of amelioration.

No system of ventilation would stand a chance of purifying and making wholesome the air within such buildings as we have described; the most that could be expected would be less vitiated air. But even this little has been denied to the barrack population, for so late as last year, in 83 barracks, containing 3130 rooms and 42,521 men, with from 200 to 400, 500, and in a very few rooms only



ROBERT DUDLEY, DEL ET LITH

A P HOWELL ARCHT

VINCENT BROOKS IMP

THE NEW VESTRY HALL OF ST JAMES'S WESTMINSTER
AND GATEWAY TO CHURCH
VIEW FROM BROADWAY



GROUP OF WINDOW & CHIMNIES IN CENTRE
OF PRINCIPAL FRONT.



PORTION OF PRINCIPAL GATES TO CHURCH YARD.



PEDIMENT & C OF CENTRAL WINDOW.



PEDIMENT & C OF DOORWAY

ROBERT DUDLEY DEL ET LITH

A. P. HOWELL ARCHITECT

VINCENT BROOKS LITH

NEW VESTRY HALL & GATEWAY TO CHURCH,
ST. JAMES'S WESTMINSTER.
DETAILS

DALTON & HOUGH, LONDON

600 cubic feet per man, no means of ventilation whatever had been introduced; and in 78 barracks, containing 2237 rooms and 33,601 men, with 230 cubic feet per man and upwards, ventilating arrangements exhibiting all stages of imperfection and inefficiency had been provided. Staircases and passages have received no attention whatever as regards ventilation.

As pure air has almost ceased to find its way into barracks, except to be instantly polluted, so water is not obtainable in a large number of barracks in a condition fitted for consumption by human beings. Most barracks are supplied by wells, generally from twenty to fifty or sixty feet deep; there are some deeper borings, but "shallow wells" are by far the more common; and as in the majority of barracks the drainage, if there be any, is most defective, the wells and underground tanks into which rain water is conveyed are polluted by infiltration from the subsoil, of water charged with impurities of cess-pools, manure heaps, ash-pits, and of the subsoil itself. In most instances the water drawn from barrack wells and tanks contain numerous filaments of organic matter visible to the naked eye. At Brompton Barracks the tank is placed within a few feet of the closets, and the water is strongly impregnated with sewage matter. In the military hospital at the Tower, not long since, the only supply to the kitchen was taken directly from the Thames where it passes the Tower. We know very well what has been the result of drinking impure water to entire districts, and if there were no other defects calculated to predispose to disease, we could not expect to find the army in a satisfactory sanitary condition so long as there is not an abundance of pure water.

One evil leads to another, and bad drainage is the primary cause of polluted water. The most perfect system of drainage employed, until very lately, provided only for the removal of rainfall and water from washhouses and ablution rooms. Privy drainage is almost unknown; large and deep ash-pits and manure heaps have no escape for the foul water, except into the soil, which soon becomes putrid, and exhales unwholesome effluvia. In cavalry barracks the cesspool and dung-heap are often together, and a process of mixing up the various kinds of manure is not unfrequently carried on by the contractor close to the men's rooms. At Brighton, the cesspool is emptied only at an interval of years, while at Aldershot, Chatham hut-barracks, and Colchester, the excreta are frequently collected and removed in trucks and tubs, rendering the neighbourhood at the time quite unbearable. There appears to be no good system anywhere; every kind of plan for the building and rooms is adopted but the right one, and throughout the entire history of barrack accommodation it would really seem that the greatest trouble has been taken to secure and perpetuate bad arrangements.

We must defer for a future article a consideration of some other defects of our barrack accommodation, which are not yet all enumerated, and of the means that should be adopted to avoid the same defects in the new barracks, which, as we have shown, it has become a duty to provide

for the large number of soldiers who are quartered where there is no room for them, not only to their own injury, but also to the injury, as regards health, of the entire army.

DESCRIPTION OF THE ILLUSTRATIONS.

NEW VESTRY HALL, PICCADILLY.

PLATES I. AND II.

THE building, of which we give the elevation and details in these plates, and which is now nearly complete, has been erected by the Vestry of St. James's, Westminster, for the purpose of concentrating the various offices of the parish in one convenient locality. Little attempt has been made at grandeur; but in turning a very limited space of ground to the best advantage, and affording facilities for the transaction of the varied and extensive business of the parish on one spot, the building may be regarded as a success, the offices being well apportioned, elegant, and convenient.

We are informed by the architect that the style is not precisely that which he would have preferred; but that he was limited in his selection by the condition that the building, when erected, must harmonize with the church and parsonage-house. This also put a limitation not simply upon his design, which was originally Gothic, but also necessitated the employment of the present materials, which are red brick and Portland stone. The only scope presented for display in the exterior was a bold rendering of the mouldings, and an enrichment of the doorway and pediments with suitable decorations, such as the Westminster Court of Arms, &c. &c., especially avoiding what is common-place or inappropriate to a semi-public building, the offices being for the use of a portion of the public only. The same principles have been observed, in execution of the boundary or fence wall and gateway to the churchyard. It will be observed in all these works that the question of durability has been kept constantly in view, to the exclusion of what may be termed "prettiness." The first cost of the works is therefore the last, as the premises will rather improve than deteriorate with age. What the architect has attempted is to display as much ingenuity and taste in the details as the nature of the building would permit, without descending to the *outré* or grotesque.

The Church that is shown in our illustration, adjoining the building, is that of St. James's, Westminster. It stands on the south side of Piccadilly, and was built by Wren in 1684. Although not one of the best of his London churches, it is well worth visiting by any one interested in the culture of ecclesiastical architecture. It contains, besides other objects of interest, a magnificent piece of carved foliage over the altar, and marble font by Grinling Gibbons, and a painted window by Waites, of Newcastle, which was added in 1848.

The Vestry Hall was built, as before observed, for the purpose of concentrating in one spot the whole of the parochial business. Hence accommodation is provided for the St. James's Savings' Bank, the rate-collectors, general vestry, surveyor's offices, vestry clerk, committee room, housekeeper, &c. &c., with every convenience suitable for their numerous occupations. The whole building is well ventilated, and the very best materials have been used throughout.

The original site for the building was especially circumscribed, and the architect had the additional disadvantage of being compelled to build upon a previously defined foundation, to which the new edifice had to be adapted. The consequence is, although the most has been made of the available space, the plan cannot be taken as a specimen for guidance elsewhere. The merit of the building is in being solid, substantial, and convenient.

The Vestry Hall has been built from the designs and under the superintendence of Mr. Albert P. Howell, by Messrs. Mansfield, of Gray's Inn-lane; Mr. George Cleverley, clerk of the works. The various works in marble have been executed and supplied by Messrs. Edwards, of Regent-street, but through Messrs. Mansfield. The whole is most substantially done, and the cost will probably be, including everything, about 6500*l*.

The first of the large plate-bending machines for preparing and bending the armour-plates for the iron steamer *Achilles*, 50, by means of hydraulic pressure, has been erected at Chatham dockyard, in the factory adjoining the dock in which the iron frigate is building. The plates are to be bent cold.

THE BUILDING, Nos. 28 & 29, UNION-STREET,
BIRMINGHAM.

PLATES III. & IV.

THIS is a bold and elegant building. The style is Gothic, adapted to the requirements and tastes of the present day. The materials are bricks, principally white, from Diseworth, in Leicestershire, and both Hollington and Bath stone, the former being used in the basement, and the latter in the upper stories. Coloured bricks are also sparingly introduced for decorative purposes, and Minton's encaustic tiles appear in the strings and architraves.

The principal front of the building measures 50 feet, and the height is about the same. The extreme depth extends to 95 feet, but the return-front is only 35 feet in width. Each shop-window measures 17 feet 6 inches in span. In designing these windows, the segmental arch has been adopted solely with the view to provide as large an open space as possible for the display of goods. These arches are constructed in the following manner: each springer fits into a cast-iron shoe, the back of which is carried to the full height of the springer: and a bar of wrought-iron passes through the base of each shoe, and, being counter-wedged at the back of each springer, connects the opposite springers like the string of a bow. The elevation and plan of these springers, and the design of the tile string-course, are shown in Nos. 1, 2, and 5, Plate IV. The arches of the two shop-windows, and of the intervening door-way, support the whole weight of the superincumbent building, the floors of which are constantly heavily loaded with goods; but not even the slightest variation has taken place in the form of the arches since the original removal of the centres, when a subsidence of one-sixteenth of an inch was observed. As the tie is of wrought-iron, and as the windows themselves are not in any way encumbered with wood dressings, this style of construction may fairly be considered fire-proof.

The jambs and arch-mouldings to the windows on the first floor are all of brick, the shafts being of stone. The elevation and the plan of the central window of this group are given in Nos. 3 and 4 of Plate IV. The same principle of decorative construction prevails throughout the design.

The cornice carries the water from the roof in a continuous gutter, into which it is conveyed by short down-rights from the parapet. This arrangement obviates the necessity for cutting up the fronts with the down-spouts, several of which would have been required in consequence of the dormer-windows.

The interior of the building is constructed, fitted, and decorated in exact conformity with the style of its external architecture, the whole having been designed by the architect and produced under his direction. The floors are carried by cast-iron columns, designed with a special view to the particular purpose to which they are applied. The walls and ceilings are boarded. The walls of the principal staircase are of brick and stone, inlaid with encaustic tiles. The elevation of the arcade on this staircase is shown in Plate IV., No. 6. One room only is decorated with colour. Throughout the rest of the interior the iron-work is painted in two plain colours, and the wood-work is varnished.

The cost of this building, without the fixtures, was about 4000*l*. The architect was John Henry Chamberlain, Esq., of Birmingham, now Professor of Architecture at Queen's College in that town. The builders were Messrs. Barnsley, and the decorative painting was executed by Mr. Whitworth, all of them also of Birmingham. The carving was by Mr. S. Barfield, of Leicester.

The building is a completely successful example of the happy applicability of its style to the Commercial Architecture of the Victorian Age, and throughout it reflects the utmost credit upon all who took any part in producing it.

ANTIQUARIAN DISCOVERY AT CHESTER.—While digging the foundations for some new houses to be erected in Eaton-road, Mr. Hitchen's workmen discovered a leaden cylinder, which, on being opened, was found to contain burnt human bones. This interesting mortuary receptacle is $7\frac{1}{4}$ inches in diameter, and 18 inches in height. The bottom is half an inch in thickness. No solder has been used in its construction, the metal having been welded together, and the top closed in by forcing it together from the four sides. The metal is of superior quality; and notwithstanding the ages it has been in the ground, there is no sign of corrosion about it. The vessel is supposed to be of Roman date.

SCULPTURE IN THE INTERNATIONAL EXHIBITION.

SCULPTURE has always held an inferior position to painting in the estimation of the British public. The Royal Academy, in its annual exhibition of works of art, filling its saloons with pictures, apportioned only a single dim apartment to statuary. Of the many thousands of persons who crowd its galleries, very few are found to devote attention to the latter; the majority content themselves with a lounge and a listless gaze after many weary hours devoted to the former. Sculpture is deemed to be more technical and less comprehensible. Mere popularity, however, is a poor and inefficient test of merit. Whilst the merest accident often arouses public attention to some work of art, it is as often to what is meretricious and showy as to real excellence. Hence an æsthetic education and training is as essential to a people as intellectual education. A perception of the beautiful in nature, or its representation by art, no more originates instinctively than scholarship or science. By encouraging the study of drawing—the primary rudiment of all the fine arts—the Guides of natural progress multiply the numbers of those who, if they cannot attain themselves to the dignity of artists, are able to appreciate the productions of genius. It is thus that our Schools of Design, now so anxiously fostered by Government, appear to us to afford the best assurance that, whatever may have been our past failure, a worthy and successful national art will at no distant future emerge. Hitherto the bane of modern sculpture has been imitation. The precious relics of Greece, instead of being used legitimately as guides to the study of nature—the source of their excellences—have been either servilely copied or studied as if they, and not nature herself, could furnish a foundation of art. It is not thus with poetry. Every great poet has, directly or indirectly, drunk deeply of the spirit of the ancients; has studied profoundly their approximation or departure from the great standard,—natural truth and beauty,—but only to kindle his emotions to awake into life and energy his own aspirations, and to serve as a rule to his artistic creations. Cupids and Venuses, Mercury, Mars, and the whole host of the mythological hierarchy, are banished for ever from verse. Why should they be eternally repeated in marble? The æsthetic character of the ancient sculptures was perfect; but the sense of beauty, and the love of it in the people of Greece, was not the only sentiment which commended those works of art to their estimation. There was also the religious element. Faith—that is, a heartfelt conviction of the existence and reality of the beings represented—strange to say, had no existence in the ancient mind. But the nearest approach to it, and in a measure a substitute for it, when in nature's deepest needs, the popular deities were evoked in the presence of the marvellous creations of the chisel, with which they were familiar. When the suffering matron, seeking from without, help in her pangs, called on Juno Lucina, she must have imagined, if not almost felt assured, that the calm and dignified form of the goddess, familiar to her in the temple or market-place, must either be, or closely and accurately represent, a living power able to hear and willing to aid her. When the soldier in the presence of danger sought the protection of Mars, or Minerva, the statues he had visited before entering upon the campaign would present themselves to his imagination, and must have been confused with their real presence.

We conceive that the creations of the poets, embodied in marble by the wondrous skill of the ancient sculptor, were accepted, and received the homage of the multitudes more from the religious sentiment, as it existed in minds destitute of a true faith, and totally in the dark on spiritual matters, than from their æsthetic culture.

But in modern times, and wherever Christianity has shed its light, the artist can hope for no such extrinsic aid to the appreciation of his creations. His Venuses and Cupids, Junos and Minervas, must be regarded simply in an æsthetic point of view. He may deserve all praise for his mechanical skill, his perception of the special beauty of the abstraction, but beyond this his work excites no interest, far less enthusiasm. Why, then, does he go on eternally repeating these exhausted ideas? Does he hope to surpass the ancient artist in his technical qualities? Alas! this task is confessedly hopeless. We may admire the Venus Victrix of a Canova, but unfortunately we remember the Medician Venus. What Apollo can rival that of the Vatican?

When Michael Angelo found the celebrated Torso, upon which he modelled his style, did he occupy himself with multiplying fragments of a body, or strive to surpass his model in anatomical accuracy, or the expression of muscular force? No; what he did was to imbibe the spirit, not imitate the letter of the ancient artist; and no comparison can be made between the results, the majestic and appalling statue of Moses and the Torso he so profoundly studied.

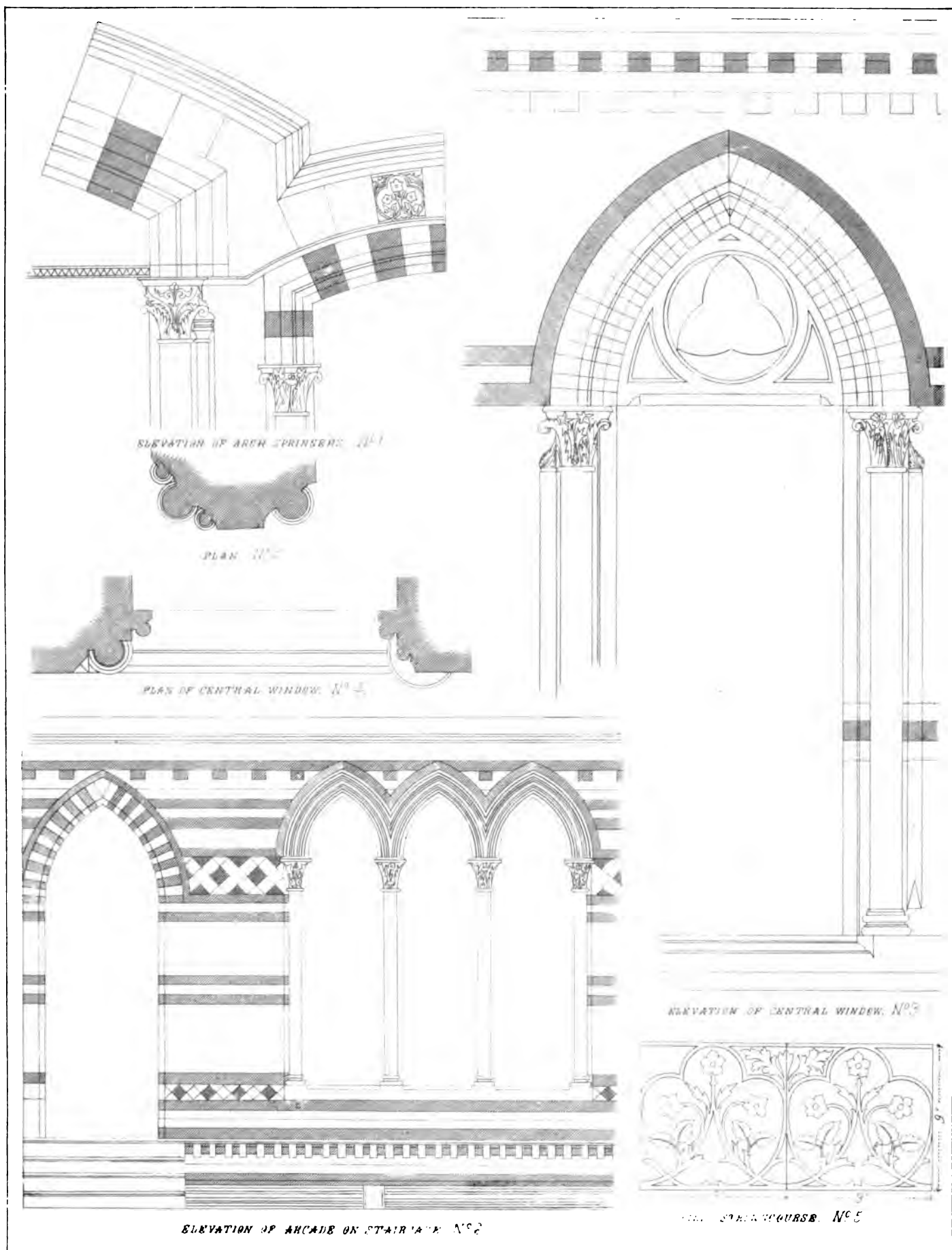


J. H. Chamberlain and Son, Birmingham.

N^{os}. 28 & 29 · UNION · STREET · BIRMINGHAM ·
ERECTED · IN · THE · YEAR · 1857 · FROM · THE · DESIGN · OF · J · H · CHAMBERLAIN · ARCHITECT · & C ·

Lith^d by T. Underwood from the Original Drawing & under the Superintendence of the Architect

DARTON & CO LONDON.



J. H. Chamberlain Architect (Inventor & Designer)

ARCHITECTURAL DETAILS OF THE BUILDING NOS. 28 & 29 UNION STREET.
BIRMINGHAM.

DARTON & CO LONDON

There is, however, a graver mistake in the imitation of the ancients than provoking unfavourable comparisons. It is alluded to by Mr. Palgrave, in his "Fine Art Catalogue of the Exhibition:—"Will it not at some time appear one of the strangest of delusions, that a mythology, dead for two thousand years, should have been fancied a living interest to the nineteenth century? There is a little dialogue in Sterne's novel which dramatically sets forth the attitude of the connoisseur and the common-sense spectator towards 'ideal sculpture':—"There are two Loves," said Mr. Shandy, 'the first, without mother, where Venus had nothing to do; the second, begotten of Jupiter and Dione.'—"Pray, brother," quoth my Uncle Toby, 'what has a man who believes in God to do with this?'"

The recognition of the spiritual nature of the Divine Being, utterly obliterates every trace of religious sentiment from the productions of the sculptor. The iconoclasts of the earlier ages of Christianity expressed this fact in actions. It can never be received among a people to whom this faith is once known, however feebly felt. We may discuss the propriety of the views held by the Roman Catholics respecting their representations of the objects of their worship; but we cannot, if we have a speck of charity, assimilate them to the ancient adoration of their deities in marble. Representations of prophets and apostles, of the Blessed Virgin, or the Saviour, can only be historic, and referable to one of the categories of art stripped of all religious reverence. Whatever amount of æsthetic culture a Christian people may possess, it will be insufficient for the creation of a real school of art at once national and worthy of ranking by the side of the ancient. Other conditions must be sought and fulfilled; deeper and more enduring feelings must be evoked and gratified. It may be true that

A thing of beauty
Is a joy for ever.

but in sculpture, a mere appeal to the sense of the beautiful will not ensure success. That some such need of an extrinsic property is dimly recognised, may be inferred from the great preponderance of nude female figures, whether under the name of Venuses or any other, over every species of ideal figures in every exhibition. We would not lightly bring such a charge against an individual, but we may ask whether, in a general way, this does not furnish a tacit proof of the enlisting of a sentiment too base for expression in plain terms, to impart interest to this branch of art?

This we conceive is as unnecessary to this noble art as it is morally wrong. Sculpture is capable of expressing the highest intellectual power conjoined with the purest moral sentiments, of giving exercise to the most exalted imagination and the richest fancy. It may embody and teach the truths, and display the mighty mysteries belonging to our nature as they become recognised by the philosopher, expressed by the poet, or emerge in the progress of our race in civilization and refinement. It may be made to harmonize with any phase of Christianity; and, like the sister arts of painting and poetry, become one of its preachers and ministers.

The thoughtful sculptor has only to look at the grounds and means of the success of modern poetry to discover the true direction of his own aims. The intellectual character, the moral and religious life, the cherished domestic and social relations of the English people, must be visibly impressed on his works. These will impart to him who has the necessary technical skill a vital energy, and ensure for him the triumph of success. A popular reviewer has recently advanced the paradox that we are not an æsthetic people, but positively prefer ugliness to beauty; and yet that "all that patronage can do has been done in England, there is no lack of purchasers for anything approaching to beauty in statuary or painting." The latter we believe to be the truth. The wealth of the upper classes is so vast, that no sculptor of merit need apprehend remaining unknown or unemployed; but he must conform himself to the people he would please. Not one of a thousand English houses can find a place for a nude Venus, Greek Slave, or Cupid: millions can afford to pay for such productions of the chisel as would adorn their homes and meet the daily gaze of their wives and daughters.

No form of Christianity can tolerate naked human forms, either male or female. The first effort of the missionary is to induce his savage auditory to adopt some form of clothing. It is a recognition of a sin-tainted race, an idea precedent of any religion in theory or practice. If nakedness does not engender lust, it is certainly inconsistent with purity. Perhaps the manner in which our International Exhibition has been originated may have imposed on the Commissioners a necessity to accept much which their taste or judgment could not approve; but it appears to us that they have abandoned all discretion in admitting so many nude figures—some positively indecent

—both of living and dead sculptors. It is absolutely distressing to witness the crowds of educated women, young and old, casting their eyes on such figures as Thorwaldsen's Jason, and others as false in form as filthy in suggestion. We turn from this painful subject.

We are accustomed to hear and read criticisms on sculpture which take for granted that there are only two forms belonging to the art—the *real*, being simply portraiture; and the *ideal*, limited to the creations of the heathen mythology. This is a strange delusion. The great foundation of all art is nature. It has two grand aims—to represent the *actual* as nature presents it in illimitable forms of beauty; and an *ideal*, by collecting and combining the elements scattered and isolated in nature. In the one, he has only to *copy* faithfully; in the other, to *create*. The former requires mechanical skill, an observing eye, a feeling for nature's inexpressible grace and beauty; the latter, superadded to all this, fancy and imagination, and a profound knowledge of nature's laws and processes. It would be convenient, were it possible, to designate by distinct appellations the two classes of artists this implies: it is inadequately done at present by the word *genius*. For both there is an inexhaustible mine in nature, and it is not unworked. To the branch of the actual in sculpture belongs portraiture; and every year busts enough to fill a Walhalla are executed, not to speak of statues. It must be admitted that overwhelming numbers of these are faulty in every degree, from absolute worthlessness to tolerably passable; but if a collection could be made by a qualified critic, enough would be found to satisfy the world that Great Britain has had in the past, and now possesses, a true and worthy school of art; an art capable of fixing in an enduring material, forms which deeply interest the present, and will be dearer to future generations.

It is in works of real genius in the ideal that we are deficient; this embraces the actual, but is a superaddition and completion of art. The true ideal is not a departure from nature: it is only a more profound perception of it—of the intention in creation, rather than what is visibly accomplished. The Great Artificer of the world has not embodied perfection in any individual human form, for example; but He has shadowed out in their species innumerable forms of perfect beauty. These it belongs to the ideal artist to discover and represent. He also may produce an ideal creation with as strict an individuality as his familiar friend, but he must use only the elements nature furnishes. The selection evinces his taste and judgment, his æsthetic character, and his power. With very few exceptions, which could be easily reckoned, some belonging to ancient, some to modern times, ideal sculpture exhibits the defects inherent in the actual. The artist works with a model before him, and it is seldom that some peculiarity of the model is not copied to mar the perfection of the ideal. This we consider to be a great fault in Gibson's tinted Venus. He has added an element usually excluded from the ideal—namely, colour, and with great mechanical skill has produced a female form of singular loveliness, sweetness, and grace (not a Greek Venus, but a pure Englishwoman, nearly naked, a most unusual condition), which would have commanded far more general admiration but for several defects evidently copied too literally from his model. There is on one of our public monuments a ludicrous example illustrative of this artistic error. A figure of Fame stands in a conspicuous public place, evidently modelled from a living female of large stature, in which is faithfully represented the fact that the model was in the fourth month of pregnancy.

Ideal art has, as we have said, a source of material in nature. Its creations may be either purely imaginative or historical. The forms of illustrious men, whose persons are almost or altogether unknown, afford a wide scope for a great artist to interpret in marble, and present to vision the creations of our own poets, to embody actions on which the fate of nations has turned. These demand real genius. Too often, alas! are they attempted with only mechanical skill, neither intellect nor feeling being present. A strange and most absurd substitute is sought in hugeness of size, as if mere magnitude could ever be a substitute for intellectual greatness! Hence the gigantic absurdities which disfigure our public places. They are too abundantly present in the Exhibition; but happily we need not dwell on failures when there is so much to excite admiration. The Commissioners have apparently used no discretion in selection, but admitted all that was offered, good and bad. Here, at least, the spectator can see and judge for himself; and if with an observant eye and mind, the great exemplar Nature is made the standard of comparison, no one can be at a loss in forming a correct judgment. If there are few of the works so pre-eminently successful as to command universal approval, there are many whence we may draw the most hopeful anticipations of a great national art of sculpture.

Confining ourselves in the present number to these general remarks, we hope to dedicate a future paper to an examination of the most meritorious in the Exhibition.

ARCHITECTURAL LITERATURE.

A DAY IN THE BRITISH MUSEUM.

BY PROFESSOR SMIRKE.

I PURPOSE on this occasion to invite your attention to one of the greatest depositories of intellectual wealth,—the Library of the British Museum.

Without attempting to bring before you even the shortest or most meagre enumeration of all the objects of interest to the architectural student which that vast repository may contain (such an enumeration would, indeed, be as much beyond my powers as it would certainly be beyond our narrow limits), without attempting any such task, I propose now to indicate to you a few of the more striking specimens of the literary and artistic wealth which are in so great abundance in the library of the British Museum, at our disposal; accompanying them with such remarks as may be naturally suggested by the consideration of the objects themselves, as I enumerate them. I do not design here to touch upon the antiquities at the British Museum: a critical examination of these, or even a correct appreciation of them, would be beside my purpose as well as beyond my powers. To enter that department would assuredly lead us into antiquarian disquisitions, which I am anxious to avoid.

The first book I shall advert to is a very large folio volume, descriptive of the great Flavian amphitheatre in Rome, and appears to have been the result of long and careful examinations made chiefly during the excavations by the French whilst in military occupation of Rome in 1811, 1812, and 1813. The author was a French architect, Mons. Paris, who had long been a resident in that city, having quitted his native country at the outbreak of the great Revolution. He seems to have been a painstaking and intelligent observer; and the delicately-executed drawings of which this volume consists, with the very minute notes explanatory of them, bear testimony to his great carefulness as an architectural draughtsman. He appears to have quitted the practice of his profession as an architect early, and to have been engaged for some years in the decorations of the royal theatres and of the opera, at Paris. During his subsequent exile in Italy those studies were made, one of the fruits of which was the magnificent volume I have alluded to.

Probably there never was executed so complete a monogram of any one building. The only subject of regret is that the drawings generally do not distinguish so clearly as one would wish between those parts which are the representations of the actually surviving portions of the building and those parts which are the conjectural restorations of the ingenious antiquary himself. Some of the drawings, however, are not open to this criticism, but are beautifully-executed delineations of the edifice in its revived state; and I can safely affirm that all the drawings bear very strong marks of having been the work of a painstaking and scrupulous artist. The work was intended and fully prepared for publication: it has remained, however, in MS., and ultimately became by purchase the property of the Trustees of the British Museum in 1847.

In many respects the Colosseum at Rome is one of the remarkable buildings of antiquity. It has all the attributes of grandeur. In its actual dimensions I believe it to be the largest single building ever erected—unless we except the Pyramids of Egypt, which are, perhaps, hardly to be classed as works of regular architecture. Its simplicity of character and unity of design are also sources of grandeur. There is a breadth of manner, and a noble abstinence from trivial ornamentation in its external architecture, which greatly elevate the character of the building. There is a majesty, even, in its stupendous strength. It stands a monument of consummate constructive talent; a talent not parading itself, like a Mediæval cathedral, by the perpetual manifestation of great efforts—lateral thrusts, and counterbalancing weights; huge picturesque masses of masonry piled up solely to resist the tendency to self-destruction constantly operating on the structure. This immense building, on the contrary, stands, and has stood for eighteen centuries, not by any straining exertion, but simply because all the laws of static science have been scrupulously regarded. I am justified in saying that it has stood for eighteen centuries; because,

notwithstanding the *concussions* of earthquakes and tempests, and the erosive agency of natural *causes*, it still stands with few marks of substantial injury, except those which it has received from the destructive hands of man.

It has been for ages the quarry whence ready-worked stones have been continually abstracted, and whole palaces have been the result of such spoliation. Yet it survives, next after the Pyramids, the greatest architectural monument in the world:—

A ruin, yet what a ruin! From its mass,
Walls, palaces, half cities, have been reared;
Yet oft the enormous skeleton ye pass,
And marvel where the spoil could have appeared.

I will not dismiss this remarkable volume from your notice without noting the extraordinary dimensions of the building which it illustrates. I find the length of the major axis to be 580 feet, and of its minor axis, 480 feet; whilst the height from the ground-line outside the building to the summit of the exterior wall is 160 feet. Mr. Paris makes an elaborate calculation of the actual number of sittings afforded by its marble benches: the result is 44,090 persons. The stories, therefore, of those (like Fontana and others) who represent the number of persons accommodated to have been 80,000, or even more, were either wild exaggerations, or it may be that this high number might have been obtained by counting the multitudes who could have been crowded into the numerous corridors, on the broad platform at the highest part of the amphitheatre, and possibly, too, on the arena itself.

I will now invite your attention to two splendid folio volumes of drawings preserved in the Royal Library, of which they form a part. The drawings are executed very carefully and cleverly in outline, slightly shadowed and tinted, upon vellum. The series comprises plans and views of the chief royal palaces of France, together with some original designs, by Jacques Androuet du Cerceau, one of the most eminent among the originators of the Renaissance in France, born about 1515.

These valuable and interesting drawings were made for Catherine de Medicis, and certainly formed part of the Royal Collection of France. How they subsequently became transferred to their present place on the shelves of our great public library is not recorded.

It is not my intention to particularize all the buildings represented in these volumes; indeed, so rich was the French crown in Châteaux and Maisons de Plaisance in the sixteenth and seventeenth centuries, that it would extend my notice far beyond its proper limits were I to do so. All the earlier examples are characteristic of the transitional period when they were erected. In plan they retain much of the type of a Mediæval fortification; and this may have been probably occasioned in some cases by the erection of the palaces on the foundations of some more ancient castles of a strictly military character. But there are few that retain any provisions whatever for active defence: the bastions become clusters of embowed windows; enriched with many architectural embellishments; and the intervening curtains are occupied entirely by wide windows, lofty chimneys, and other features of domestic architecture, to the exclusion of the loopholes and frowning machicolations of the preceding ages.

The book which next comes to hand is a splendid volume of earlier date than that to which we last adverted, and is not without a certain amount of romance in its history, for it consists of verses composed by the Duke of Orleans after his capture at the battle of Agincourt, and with which composition he beguiled the tedium of his imprisonment in England. The illustrations are beautifully-executed miniatures, and of great interest as explanatory of the buildings, habits, and costume of the period. One of these illustrations is of especial interest, as it presents a view of London in the fifteenth century. It is taken on the banks of the Thames, and represents the Tower in the foreground and the bridge in the middle distance. The very rapid shoot of the current at the bridge is plainly indicated. At a short distance from the Tower is seen the creek of "Bellyne's gate," on the banks of which creek and below bridge is a considerable building, probably the Custom-house. The architecture of this building is portrayed with great minuteness, and is manifestly drawn from the actual objects, not conventionally, but with considerable effort at correctness of representation. It is worthy of observation that the lowest story consists of an arcade of perfectly Renaissance character, the arches being circular, or nearly so, springing from ordinary columns apparently very much like Roman Doric.

The superstructure, however, is of quite Mediæval character, presenting a series of steep gables of dissimilar designs, and with the

windows apparently mullioned. The perfectly Italian aspect of the lower part of the building seems to me to be conclusive evidence of the existence of the style of the Renaissance in England very much earlier than is usually supposed.

Now that I am touching on the subject of illustrated manuscripts, I need not omit allusion to the remarkable book known as the "Codex Aureus." It forms part of the Royal Library collected by George III., and is certainly one of the gems of that collection. It has many claims on our attention, inasmuch as it appears to be beyond a doubt that it was executed for Charlemagne. It is enriched with magnificent illustrations, which may be fairly presumed to be specimens of the highest art which Europe in the beginning of the ninth century was capable of producing, and is, moreover, considering its great age, in excellent preservation. The prevailing character of the architectural features is manifestly what it is usual to designate as Romanesque. Each page represents one arch divided into three subordinate compartments by slender pillars carrying three arches. This arrangement of arches seems to have taken its rise somewhere about the period in the history of architecture with which this volume is contemporaneous; perhaps, indeed, even earlier.

The practice of building small arches in a continuous series, springing from the capitals of small pillars, bears a far earlier date. We find them in abundance at the Palace of Diocletian. Such small arcades occur, too, at the building near Ravenna, called Theodoric's Palace, and a continuous range of them originally encircled the multi-angular tomb of that monarch. These small arcades, arranged in successive superimposed orders, came to be used to excess, as you, no doubt, well know, and covered the towers and gables of the Lombardic and subsequent ages. I may add that in paintings and mosaics of so early a date as the fourth century, represented in Seroux d'Agincourt's great work, these arcades abound.

But in the illustrations of a manuscript preserved in the Laurentian Library, at Florence, to which the date of the fourth century is assigned, a more distinct foreshadowing occurs of the Gothic mullioned window. It represents a large semicircular arch, comprising within its span four minor arches, thus dividing it into four narrow openings. It is true the head of the large comprising arch is blanked: there is shown on it a circle, probably decorative only, and not perforated; but the transition from this to an ordinary four-light Gothic window is easy and natural. In the "Codex Aureus," to which I have been referring, we have very plainly this germ of the Gothic window, and we have it even more distinctly developed in MSS. of the ninth century, of which representations are given by D'Agincourt. But not only were these small arcades the putative parents of mullioned windows; to them, also, it can hardly be doubted, we owe the triforium of our ecclesiastical architecture. I cannot refrain from here reminding you of the analogous use of these subordinate arcades in the Westminster Hall, as built by our William Rufus. In the twenty-sixth volume of the "Archæologia" you will find the representation of that triforium story forming an open arcaded passage-way, obtained in the thickness of the wall. This curious feature in the domestic architecture of the twelfth century I had the pleasure of being the first to explore and delineate, when the interior of the walls of Westminster Hall was opened out and exposed to view, under my brother, Sir Robert's directions, with a view to the refacement of masonry of those walls in 1837.

THE CROSS.

THE Cross is the earliest and the most national of our public monuments. It dates from the first traditions of our island history in the "Suenos stone" near Forres, and the curious monuments which have been ably reproduced by the care of the Spalding Club in the "Sculptured Stones of Scotland." Four crosses still stand on the consecrated shores of Iona, where it is reported that 360 of these venerable monuments once marked spots dear to piety and affection. The large Iona cross in front of the cathedral is a monolith column of the hardest whin rock, 14 feet high, 18 inches broad, and 6 inches thick. It is fixed in a pedestal formed out of a massive block of red granite about 3 feet high. "The labour and art," says Mr. Graham, "of quarrying such a column, of transporting it to the island, and of carving and erecting it when it was brought, are circumstances really astonishing when one considers how inadequate the power and the skill of this part of the country would now be to such a work." It would seem that the practice of erecting these crosses lasted in Iona down to the Re-

formation, for that of Abbot Mackinnon, still standing, bears date as late as 1489. For monuments on a comparatively small scale, connected with the memory of the dead or with ecclesiastical associations, we know of nothing comparable in effect to these crosses, and their monolithic character gives them importance and extreme durability. But under the denomination "cross" we include not only these primeval monuments of a rude antiquity, but some of the most exquisite remains (alas! too few) of Gothic architecture. Most of the cathedrals had their "cro-s" in the precincts of the chapter-house: thus Paul's Cross was the scene of the great ecclesiastical debates of the Middle Ages and the Reformation, and also the Forum of the citizens of London—though indeed Paul's Cross had no claims to monumental beauty, if, as Strype states, it was merely "a pulpit cross of timber, mounted upon steps of stone, and covered with lead."

These mediæval crosses had not necessarily an ecclesiastical character. The Cross of Coventry, which was the most elegant and splendid fabric of the kind in England, was built in 1541 by a bequest from Sir William Hollies to the city for municipal ornament. It was of a hexagonal shape, 57 feet high and 42 in circumference, decorated with the most elaborate tracery of the time: unhappily it was taken down by an "improving" corporation in 1776. The crosses of Cheddar, Malmesbury, and Chichester are small roofed buildings of the form which may also be seen in the curious, though not very pleasing, Royal Cross of Aberdeen.

The crosses which marked the transport of the body of Queen Eleanor from Herdeby in Lincolnshire to Westminster, have all but disappeared: that which occupied the well-known site in the village of Charing (supposed by some to be derived from *chère Reyne*), still lives in the name of the busiest thoroughfare of western London. The crosses of Geddington and Northampton (the Queen's Cross) are preserved, and the cross of Waltham, erected on the same melancholy occasion by the piety of Edward I., has recently been most skilfully restored. It is a hexagon, each side of the lower story divided into two arches, charged with the arms of England, Castile, Leon, and Ponthieu; the puffed finials of the second story cover twelve open tabernacles, intersected by pillars, the niches being filled by appropriate figures; and the third story rises in solid masonry to support the shaft of a plain cross on the summit. In our judgment, no monument designed to commemorate the dead can be more touching and appropriate than this. It admits of the introduction of sculpture, it admits of inscriptions; and provided it be suitably placed, as, for example, in the quadrangle of a college or a cathedral close, it may unite all the conditions of a Christian and English monument. Indeed, the example of the Scott monument at Edinburgh, which is in fact one of these crosses, shows that it may be placed without impropriety even in the thoroughfares of a great city, which has in other respects nothing of the mediæval character. We confess that we regret that the monument erected at Scutari, by order of her Majesty, to record the gallant endurance of the British army in the Crimean war, did not assume the shape of one of these eminently national structures, endeared to us by historical tradition and religious associations, in place of the obelisk of Cornish granite which has been placed there.

HARBOURS OF REFUGE.—The annual return, showing the progress of works and harbours of refuge, has been issued. At Dover, where 500,000*l.* have been laid out, and a vote of 50,000*l.* is to be taken this year, to be followed by 100,000*l.* more in future years, the length of the pier founded is now 1573 feet; and 1390 feet have been completed to the quay level. The South Eastern Railway is now carried on to the pier. At Alderney, 1220 yards of sea wall, and 1226 of harbour wall of the western breakwater are complete except the coping; and the promenade wall is ready for the coping for a length of 1217 yards from the shore. The base of the breakwater extends 1636 yards from the shore. From 500 to 700 men are kept employed at this work; for which there have been voted 937,000*l.*; the total estimate being 1,300,000*l.* Of the breakwater at Portland, which is to shelter 2130 acres of the bay, the centre of the north head is 8512 feet from the shore, and the depth of water $9\frac{1}{2}$ fathoms at low water of spring tides. During the heavy gales of February and March many vessels took refuge within this harbour. The votes already passed for the works at Portland amount to 973,000*l.* The total estimate exceeds 1,000,000*l.* Upwards of 5,000,000 tons of rough stone have been deposited since the commencement.

"The whole world without art and dress
Would be but one great wilderness."—Butler.

REVIEWS.

CARTHAGE AND HER REMAINS.*

WHATEVER may be said of the Victorian Age for its lack of originality in creating new architectural and artistic designs, no one can deny it the merit of having done much to restore the past and bring us again face to face as it were with the great nations of antiquity. Whilst history was studied from books alone, little progress could be made. So much of the literature of the elder nations of the earth had been lost, and the works of the few authors that remained represented so many separate nationalities; knew so little of each other and were so divided both in faith and feeling, that ancient history was, to a very great extent, guess work: the materials, indeed, were not at hand by which anything like a consecutive or reliable history of the world could be formed. This was especially true of Egypt, Assyria, Phenicia, and Etruria. What, however, was wanting in books has been amply supplied by antiquarian discoveries, and the nations which once sat in the darkness of night, are now the most thoroughly understood of any that have ever lived. This may at first seem paradoxical; but it is nevertheless perfectly true, that we know more of the life, manners, and customs of the people of Egypt who lived three thousand years ago, than we do of that of Rome or many of the nations of modern Europe; and yet the Egyptians have not left a single volume. A few extracts from Manetho, certain portions of the "Book of the Dead," together with a few scattered fragments, are all that remain of the literature of this great people. But what was wanting in their books is amply supplied by their monuments, and we know accurately now what they did in life, and what they hoped for after death. The lives and conquests of their kings, their method of warfare, the arts of peace and industry, their feasts and games, their seasons of joy and hours of sorrow, with all their implements of trade and industry, are as familiar to us as are those of our forefathers of the last century. What fossils are to the geologist, pottery, statuary, bricks, and ruins are to the historian: given these things, and we can predicate, with absolute certainty, what the state of society was in which any people lived, although history may not record one sentence concerning them. As the palæontologist, with his fragments of bone, can reconstruct the whole animal, and inform us what the state of the country was when the monsters of the oolite age were supreme in England, and the earth, air, and sea were peopled with the iguanodon, pterodactylus, and ichthyosaurus; so the patient student of antiquities can bring again from the dead the buried nations of past ages, and read from the scattered remains of the race a history of the people from

Hieroglyphics on Egyptian stones,
Though not a pinch remains of Cheops' bones.

In the work before us, Dr. Davis has presented us with a very valuable and readable book, upon a subject which must always be of great interest to every student of history; and although we cannot award the same amount of praise to him as we do to Layard and some others of our explorers amongst the lost cities of the world, still he has his merits, and they are neither small nor inconsiderable. As an author, he wants tact and a nice perception of the fitness of things; but in a case like the present we are happy to receive any contribution that shall throw light on the history of the people who formerly dwelt on the shores of the Mediterranean Sea. In a dry and thirsty land we are glad to receive a hearty draught of water, and not too anxious to criticise the construction of the filter through which we have obtained it.

Carthage, the Tarshish of the Prophets, must always have an interest for all who value sacred literature. It was a flourishing kingdom in the time of David; and the architect who built the Temple of Solomon and the artists and art workmen who adorned it were sent to Jerusalem from this city. The king also lent to Solomon one hundred and twenty talents of gold, gave him his daughter in marriage, and some time later built a navy for him, and had, we know not how, whether by the Canal of Psammethichus, across the Isthmus of Suez, or else round the Cape of Good Hope, the ships transferred to the Red Sea. These events, together with the accounts left us by the Roman poets and historians, seem to have fired the imagination of Dr. Davis when quite a lad, and, as a natural consequence, he fell in love with Dido. The youthful flame, however, burnt low until the Doctor was actually on the site trodden by his ideal heroine three thousand years

ago, when the old fire *was revived* in all its ardour, and he earnestly resolved to disinter the *remains* of the once famous city, and thus supply some links in the *chain* of the history of a once noble people. Hence he proceeded to commence his excavations.

Digging trenches, however, and making excavations through huge heaps or mounds of earth, and seeking for curiosities in the ash-pits of a city that has been buried for nearly twenty centuries, is dull, heavy, and too often disappointing work. Besides this, there is also the difficulty of finding proper workmen, and the jealousy of the Oriental officials to be overcome, who all believe that we are seeking not for curiosities but for buried treasures in gold, silver, and precious stones. However, as the Mahometans say, the Franks overcame everything but death. All difficulties were finally superseded, and the work commenced in earnest, and the results of the explorations are now in the British Museum.

Few people are aware of what our Government are at present doing to promote the higher, and consequently all branches of literature. When there is so much boasting about the patronage which foreign Governments bestow on art and learning, it would be ungrateful in us, who make literature a profession, if we did not put in a claim for blunt, honest John Bull, who is without a rival in the civilized world for the substantial aid which he affords to the earnest student and author. What the sun is to the solar system, the British Museum is to the literary world. It is not the only point of light, but it is the greatest, and its rays span vast domains of space, light up other nations, and impart lustre to our many colonies. Here all authorities, ancient and modern, are brought together, and hence it becomes the test-chamber and proof-office where the world's knowledge is assayed. It has the best library and finest reading-room in the world. In no place has the student the same attention and facilities for study. We doubt if there be another institution which has such a staff of able, polite, and kindly disposed officers, whilst its collection of objects of historical and scientific interest is so vast that it is difficult to catalogue them. Here all the waifs from Time's deep ocean, where so many races have perished, find a home and resting-place. The footprint of the Labyrinthodon, who left "his mark" upon the Sandstone rock a hundred thousand years ago, the Rosetta stone, and the brick library of Nebuchadnezzar, are all preserved in adjoining rooms. It was here that Dr. Davis came for help; was kindly aided by M. Panizzi and the trustees, and through them by the British Government. The knowledge of this fact had a magical influence on the authorities at Tunis. With this patronage, and ample means at his disposal, the doctor commenced his labours, and the result is the fine Mosaic pavements and other objects of ancient art which may be seen in the British Museum, and, we may also add, the readable and valuable book before us.

Leaving Tunis with about fifty people, and proceeding to the site of Carthage, which is about ten miles distant, he commenced his explorations at what appeared to be a likely spot, as there were signs of vast ruins; but after many weary days the place was abandoned. He then opened fresh workings at St. Louis Hill, which is believed to be the site of the ancient temple of Esculapius, but did not succeed in finding anything of very great interest. What surprised him here was the barbarous mutilations to which every work of art had been subjected by the succeeding shoals of Christian and Mahometan, who had successively held possession of the country, and rivalled each other in this vile spoliation; and so thoroughly had they accomplished their work that every statue is broken in pieces. Fragments of hands, limbs, and heads are scattered everywhere, but nothing else remains. The destroyer has been everywhere, and has broken everything from his love of destruction.

At another spot Dr. Davis was more fortunate, and in uncovering the old Temple of Astarte he came upon a fine piece of Mosaic pavement, which was some reward for his long toil and many disappointments. Upon the whole, however, his discoveries are of small value when compared with those of Layard; but such as they are we gladly accept them.

A great portion of the work, however, has no reference at all to the explorations, but might as well have appeared in any other form. The chapters devoted to the history of Carthage are appropriate enough, but the stories about the Arabs, &c., are scarcely in keeping with the rest of the text; however, the book is readable and interesting. It is a good book, but not the best that might have been made out of such ample materials.

* *Carthage and her Remains: being an Account of the Excavations and Researches on the Site of the Phenician Metropolis of Africa.* By Dr. N. Davis, F.R.G.S. London: Bentley.

"A true artist should put a generous deceit on the spectators and effect the noblest designs by easy methods."—Burke.

HISTORY OF BRICKS AND TILES.*

HER MAJESTY'S Commissioners of Patents have issued an excellent volume, edited by Mr Bennett Woodcroft, of the Great Seal Patent Office, in which they give a history of all the patents that have been granted in England for the manufacture of bricks and tiles. It is, of course, what is popularly known as a "blue book," and contains about three hundred pages, exclusive of the introduction, giving in an abridged form the specifications of nearly one thousand patents which have been registered during the last two hundred and fifty years. The first on the list, dated 1619, is for a tile, pipe, and "paving-stone" making machine, "granted to John Etherington, shewing that whereas he hath found out 'The arte of making a certain engine to make and cast clay, of alle sorte of earthen pipes for conveyance of water in the earth, and also mulions and transomes for windowes, crests for houses, tyles and paving-stones,' his Ma^{ty} doth hereby graunt unto him sole power, for 21 yeares, to make and use the said engines for the purposes aforesaid, paying yearelie unto his Ma^{ty} Exchequer, xxvj^s viij^d." The next relates to the use of peat for the burning of bricks; and the third, dated 1632, and granted to Thomas Grent, comprises, amongst a variety of inventions, including the "moving of ships without wind;" also "a buildinge moulde or stone presse, very requisite for the building of churches or greate houses, by which stone windowes, door cases, chimney pieces, &c., are made more speedily without hewing, cutting, sawing, carving, or ingraving, as alsoe bricks and tiles, more beautifull to the eye, and more dureable against foule weather; being as smoothe as glasse on the one side or end, with divers colours and workes, as if they were carved by skillfull hands and curious workmanshippe."

The introduction has been written with great care, and gives an interesting history of brickmaking from the earliest ages. The author says:—

The art of the brickmaker has been practised by nearly every civilized nation of which we have any record; the manufacture of bricks, and the employment of them for building purposes, dating from the remotest antiquity, and the use of that distinctive form of bricks to which we have given the name of tiles being probably almost, if not quite, as ancient. Nor is this to be wondered at when it is recollected that in all countries where timber or stone are difficult to procure or to work, the natural resource must be the employment, as a building material, of baked or sun-dried earth or clay, in some shape. In such districts or provinces, however, as furnish stones of portable dimensions, or accessible and easily-worked quarries, and in such as abound in timber, the building art has often made great progress without recourse being had to artificial materials; and in these localities, bricks, being little needed, are often almost unknown, and sometimes even tiles are little employed. Portions of Norway and of Switzerland may be referred to as furnishing examples either of the exclusive use of timber or of its employment in conjunction with only a small quantity of stone for structures. Certain districts of France in the Middle Ages, and some parts of the north of England and Scotland at the present day, furnish on the other hand instances of the almost universal employment of stone with just so much timber as is indispensable, in each case to the exclusion of brick; but exceptional localities such as these afford almost the only instances of the total absence from buildings of some form or other of artificial building, roofing, or paving materials.

The Babylonians, the Egyptians, and the Assyrians, among the nations of remote antiquity, all made use of bricks, to a great extent, and in the Bible references to this material, as made among all of these nations, are to be found. These references form the earliest authentic accounts of the employment of bricks; but Josephus mentions a tradition which attributes to the sons of Seth a knowledge of their use, and which, if true, would thus carry back their origin to the very earliest period of the history of the human race.

The first mention of bricks in Scripture is to be found in the account (Genesis xi. 3, 4) of the building of the city and tower of Babel. Here the making and burning of bricks is spoken of as the first work undertaken preparatory to building, and it is worth remark that the work incidentally betrays the fact that he was writing at a time and in a place where stone was, principally, if not exclusively employed, for he says, "brick had they for stone."

The next Scripture mention of bricks occurs in the account of the bondage of the Israelites in the land of Egypt (Exod. i. 13, 14, and v. 6-19). Here we have an account of the employment of the captives in the manufacture of bricks, and also in the erection of buildings for Pharaoh.

In the history of David (2 Samuel xii. 31), we have a reference to a brick-kiln, not, however, in the territory of the Jews, but in the adjoining country of the Ammonites; for it is in that history recorded that, having taken Rabbah, the capital of that country, David, beside other modes of destroying or humiliating the inhabitants, "made them to pass through the brick-kiln."

In the book of Isaiah bricks are twice mentioned, and in both cases in such a way as to show that they were held in low estimation as compared with stone. In the first of these passages (Isaiah ix. 9, 10), the prophet says that the people "say in the pride and stoutness of heart, the bricks are fallen down, but we will build with hewn stones." In the second passage (Isaiah xlv. 3), a long series of gross breaches of law and propriety are being recited, and among the first of them occurs the reproach that the people "burneth incense upon altars of brick."

In the book of Jeremiah we have again a reference, at a date about eight centuries after the one in the book of Exodus, to the brick-making of Egypt. The Jews at that time had fled into Egypt, and the prophet, who was among them, being about to proclaim the destruction by fire of the gods of the Egyptians, was thus directed (Jeremiah xliii. 9): "Take great stones in thine hand, and

hide them in the clay in the brick-kiln, which is at the entry of Pharaoh's house in Tahpanhes."

Lastly, in the book of Nahum, there occurs a reference to the city of Nineveh (Nahum iii. 14), from which it is clear that bricks were understood to be the ordinary material applicable to the fortifications of that city. Foretelling invasion and attack, the prophet says: "Draw thee waters for the siege, fortify thy strongholds: go into clay, and tread the mortar, make strong the brick-kiln." And these references to the customary employment of brick by the Babylonians, the Ninevites, and the Egyptians, will be found corroborated by the accounts of profane historians, such as Herodotus and Xenophon, and by the researches of modern discoverers.

Among these three nations the use of two sorts of bricks, some being kiln-burnt and others merely dried in the sun, appears to have been general; the employment of glazed or enameled bricks as a decoration for the face of walls appears also to have been common both at Nineveh and Babylon, and an immense number of glazed and coloured bricks exist among the ruins of both these cities.

Many ancient bricks show marks of having had reeds or other such substances worked up along with the material of which they were made, apparently to render it more tenacious. The Scripture account of the brickmaking performed by the Israelites in Egypt, already referred to, shows that they were compelled to employ straw in forming the bricks they made. It was also, for many ages, customary to stamp each brick with a device or an inscription, or both, a circumstance which has afforded much useful historical information as to the date and occasion of the erection of the buildings from the ruins of which they come; thus, for example, Mr. Layard was enabled to identify the celebrated "Birs Nimroud" as the ruin of a building of Nebuchadnezzar, by finding that every brick removed from that mound was impressed with his name. Egyptian bricks are usually inscribed, and it was enjoined by law (Smith's Dict. Antiquities, art. "Later") upon the Romans that the bricks they made should be thus marked. Bricks so inscribed have been found in our own country at York, and bear marks showing the presence of certain Roman legions, for or by whom they were made. The same thing has occurred in Germany, and at Caerleon. (Dict. of Arch. Pub. Society, art. "Bricks.")

Herodotus, describing the building of the walls of Babylon, says: "They made bricks of the earth, borne out from the trenches, and having drawn out a suitable quantity, they burnt them in furnaces." This is said to be the earliest reference in profane history to the subject; many subsequent ones might, however, be adduced, relating both to the works of the earlier nations already named and to those of the Greeks and Romans. Many specimens of inscribed bricks, the Assyrian ones being impressed with inscriptions in cuneiform characters, and the Egyptian ones with hieroglyphics, may be seen in the British Museum. For a full account of the manufacture, as practised by the Egyptians, with an engraving from a celebrated painting in a tomb at Thebes, representing the process, and for illustrations of the almost universal employment of this material, consult Sir Gardiner Wilkinson's works. (Ancient Egyptians, vol. ii. pp. 97, 98; also Manners and Customs of the Egyptians.)

The Greeks appear to have built less in brick than the Egyptians or the Romans, yet it is clear that they did employ bricks to a considerable extent. Pliny informs us that the Greeks made four sizes of them, and Vitruvius also refers to the same fact. The Romans are known to have employed bricks most extensively, and have left many remains of brickwork in every part of their dominions. On this point a reliable authority observes (Dict. of Arch. Pub. Soc.): "Examples might be multiplied of the mention of bricks by Greek writers;" and adds: "The mention of bricks is very frequent among the Latin authors, especially Columella *De Re Rust.* lib. ix. 1, 2, 6, 4; Varro, lib. i. 14, 4; Pliny, *Hist. Nat.* lib. vii. 57, xxxv. 48, 49; and Vitruvius, particularly lib. i. cap. 5, lib. ii. cap. 8; who also, lib. ii. cap. 3, devotes an entire chapter to this subject;" also "Palladius, apud Scriptores, *Rei Rusticæ*." The bricks of the Romans, and no doubt those of the Greeks also, closely resembled our tiles, being flat and hard burnt, and ordinarily of a red colour; Egyptian and Babylonian bricks resemble more closely those in common use in our own country, both in their proportions and in colour, being frequently pale.

Some of the largest masses now remaining of Roman work, executed entirely in bricks, are to be seen at Rome on the Palatine Hill, and in the ruins of the Baths of Caracalla; but the most ordinary method of employing bricks in Roman work was not to build with them alone, but to introduce them in bonding courses, alternating with courses of loose rubble work, and as voussoirs in turning arches over openings, or in relieving arches; instances of this are universally visible in Roman remains, now that the masonry or cement with which such walls were most frequently intended to be faced has fallen away or been removed. During the Empire, the Romans often built walls of rough masonry faced with small hewn blocks, alternating with beds of brickwork, and in this description of work the brickwork was always intended to remain visible.

Of course no one will in future think of taking out a patent for anything connected with brick and tile-making without consulting this useful volume. Architects and builders will also find much interesting matter in it; and we have to thank Mr. Woodcroft and the Commissioners for presenting at one view, and at the small cost of five shillings, an analysis of all that is really worth knowing on this interesting subject.

DRINKING FOUNTAIN IN THE REGENT'S PARK.—Under the direction of the First Commissioner of her Majesty's Public Works (the Hon. W. Cowper), a drinking-fountain has been erected in the Regent's Park, from the design of Professor Westmacott, R.A. It was executed by Mr. J. Sherwood Westmacott. The structure consists of a tazza of black enamelled slate, 7 feet in diameter, resting on two steps of Portland stone, of which the lower is 11 feet square. On the tazza are two swans in electrotype, from whose bills the water is projected. Above these is a red granite column and base, surmounted by a female figure carrying water-vases, also in electrotype. This latter and the swans were electrotyped from the sculptor's models by Messrs. Elkington and Co. The tazza was executed by Mr. Magnus, of Pimlico. The entire height of the fountain is about 14 feet.

* *Patents for Inventions: Abridgments of the Specifications relating to Bricks and Tiles.* Printed by order of the Commissioners of Patents. 1862.

THOUGHTS, PRACTICAL AND PHILOSOPHIC.

THERE is in the British Museum a choice collection of Egyptian toys. When viewing those relics of an age so remote, one scarcely fails to reflect that in all likelihood—when those toys were prized possessions of some young Egyptian boy or girl—the power of the Jews was in its infancy, and that since the days when these were fashioned mighty people have risen and declined; great buildings have been reared and fallen into ruin and decay; nations have moved from barbarism to high conditions of civilization. It is curious to compare these seemingly trifling objects of antiquity—to wander in our national collection, and thoughtfully note the rings, the beads, brooches, and other personal decorations of the ladies of Egypt, Nineveh, Babylon, the famed places of Ancient Greece, of the once mighty and glorious empire of Rome—we may then turn with advantage to similar matters which have been the fashion in our own land, tracing them from very rude conditions to the rich, costly, and beautiful works of the Middle Ages. We may then glance, by way of comparison and contrast, at ornaments used at the present day by those on whom the dawn of civilization has scarcely shone. Changed by conditions, guided by their skill in art, and by the possession of materials which are accounted the representatives of wealth, the nations of the world in the days of their power have produced choicer works than can be found amongst the Sandwich Islanders, or amongst the ice-bound dwellers of the far north. In all these conditions, however varied by time or situation, we find the natural instincts of our nature the same: the crown of feathers of the American chiefs; the peculiar head-coverings of the Pharaohs, the kings of Nineveh and the Jews; the garlands of laurel, which in time were changed by the Roman conquerors and governors for circlets of gold, and the crowns of monarchs in our own day, are all expressive of the same feeling. These wooden dolls and other toys serve to show the unchanging peculiarities of mankind; for, although thousands of years have made the world older since they were used, the dolls would be amusing to very young ladies in the reign of Queen Victoria. Infancy does not always like the most refined shape of playthings. In the nursery we have seen the most beautiful of dolls, with red rosy cheeks and lips and blue eyes, gay with satin and ribbons, thrown to one side for a black, or perhaps headless, doll, disorderly and shabby. That “there are few things new under the sun” is shown by the Egyptian antiquities. Here is the hand-ball, covered with leather, and filled in exactly the same way as the balls which are now to be bought in the Lowther Arcade and elsewhere; and there are marbles, the delight of the boys, of different hues. The artificial lemon and other fruit, the egg of porcelain or glazed pottery, the little perfume-box, and glass beads, are still common enough, and so the world runs on—perhaps in a circle.—*Builder*.

BEAUTY.—As long as Athens and Sparta maintained their independence, and reverence for the laws was the basis of their constitution, taste was immature, art was in its infancy, and Beauty was far from swaying the disposition. It is true, poetry had essayed an elevated flight, but only in the soarings of genius which we know is closely connected with a state of rudeness, and is a light which frequently shines from the midst of darkness, which thus testifies rather against them for the taste of its age. As the golden age of art advanced under Pericles and Alexander, and the influence of taste extended more widely, we find no more Grecian energy and freedom. Eloquence adulterated truth; wisdom was an offence in the mouth of a Socrates, and virtue in the life of a Phocion. The Romans, we know, were obliged to exhaust their strength in civil wars, and, enervated by eastern luxury, to bow beneath the yoke of a future dynasty, before we see the triumph of Grecian art over the rigidity of their character. And the dawn of civilization did not break over Arabia until the energy of its warlike spirit had become relaxed beneath the sceptre of the Abassides. The fine arts did not appear in modern Italy till the powerful alliance of the Lombards was broken, till Florence had submitted to the Medici, and the spirit of independence in all those vigorous states had given place to inglorious submission. It is well nigh superfluous to cite the examples of modern nations, whose refinement increased in proportion to the decrease of their self-dependence. Whenever we turn our eyes to the past, we discover that taste and freedom desert each other, and that Beauty sounds her dominion only upon the ruins of heroic virtue.—*Schiller*.

THE DIGNITY OF LABOUR.—“During the last months of 1850 thousands and tens of thousands of the well-skilled artisans of Prussia, Austria, and other German states, had laid down the peaceful imple-

ments of their handicraft, and were training their fingers to the bloody trade and weapons of war. And was this the time?—was this the juncture of favouring opportunities for the Great Exhibition of the arts and industries of all nations? So its originators believed. Against the mind of the million they believed it steadfastly. To their faith the *now* had come for the complete realization of the magnificent conception. Unaided by legislation, with no governmental power or authority to lean upon, they sent out their idea, dove-like, among the divided populations of the earth. It dropped into the hearts of peoples like a still small voice of Divine inspiration. It permeated the minds of the masses, and touched their sympathies to the finest issues. It worked upward into the highest ranks of human society, and downward into its lowest conditions, and pervaded and united all with the common sentiment that the great day of UNIVERSAL LABOUR had come, when it was to be crowned with glory and honour, and the homage of potentates and peoples. Away upon the sea, to distant islands and continents, flew the summons of that thought; and the sons of toil, of every handicraft, and clime, and colour, opened their hearts to its message; and it thrilled their fingers with such ingenious activities as never before wrought in the mechanical creations of human skill. The great day of LABOUR had come. The queen of all the earthly conditions of humanity was to be brought to her throne, with kings and queens as her train-bearers, with shoutings of grace and glory to her sceptre from the many-tongued myriads of her subjects. Labour, patient, peaceful Labour, that from the closed gates of Paradise went forth weeping into the wilderness of life, and tracked it with the red pathway of her bleeding feet; Labour, that had made bricks without straw in Egypt, and lain pale and hungry, and begged for crumbs on the door-stones of palaces, which her blistered hands had filled with dainties which the eye and appetite of ungrateful luxury could not enjoy; Labour, that had walked and worked her way through the barbarisms and feudalisms of the past, with the fetter-prints of bondage still fresh and crimson around her limbs; meek, lowly-minded Labour had come to her immortal *now*, to the day of her august coronation. And her lowly men of might, who bore in their sunburnt foreheads and in their horny hands the dusky signets of their loyalty, felt that her day was come. And with a new sentiment of dignity, the pearl-divers of distant seas, with strong and downward beat, descended to deeper fathoms of the ocean's depths, and searched its shining bed for ‘gems of purer light serene’ than ever shed their lustre on regal courts; the diamond-diggers of different zones hunted with new ambition for the costliest stones of the earth's treasury to stud the coronation jewellery of Labour; and the trappers of frozen regions, and the fishermen of the Poles, the men of the mines of deeper fathom than the sea; the diggers and workers of all the precious and useful metals and minerals which the earth contains; the workers of the spindle, shuttle, and needle; the artisans of hostile countries forgot their nationality in the sentiment of the dignity of their common condition, and all wrought, with the highest enthusiasm of their genius, to bring the masterpieces of human art to the crowning of Labour. And the kings and queens of the earth felt that the first jewels of their crowns owed their lustre to Labour, and they brought them forth to shine among the gems of her coronation, in the great Temple of Peace and Concord. And the first queen of the world acted as bridesmaid at the royal robing of Labour, and in sight of the congregated nations she set the tiara of the world's homage on her brow, and gave her a glorious bride, to the dignity of universal humanity, as the first-born and fairest of the earthly offspring of Omnipotence. And who among the thousands that filled, or the exulting millions that surrounded, the Crystal Temple on that august occasion, could doubt that its illustrious *now* had come, with its world-full of the finger-prints and finger-guidings of Divine Providence—with its favouring sympathies beating fellowship in the bosoms of nations—with attractions and unprecedented opportunities for the realization of this magnificent scheme of peace and human brotherhood?”—*Elihu Burritt*.

Art is more godlike than science; science discovers, art creates.

Art surpasses strength, and patience and reflection make those things possible which in the first instance appear almost insurmountable.

True art finds beauty everywhere.

“The enemy of art is the enemy of nature. Art is nothing but the highest sagacity and exertion of human nature; and what nature will he honour who honours not the human?”—*Lavater*.

“We speak of profane arts, but there are none properly such. Every art is holy in itself; it is the son of Eternal Light.”—*E. Tegner*.

GENERAL INTELLIGENCE.

MR. J. P. PRITCHETT, of Darlington, suggests the following "Outline of a Scheme for Forming an Architectural Alliance."—1. That it be called "The Architectural Alliance."—2. That although for the present it is desirable to confine it to the United Kingdom, the extension of its operation to other countries shall be kept in view.—3. That its object shall be to promote united action among the otherwise isolated architectural societies, and to aid the establishment of new local societies where not now existing.—4. That it shall take cognizance of all matters affecting the interests of the profession. That for its object it shall especially direct its attention to the present unsatisfactory mode of conducting competitions, and shall endeavour, by the publication of a scale of charges, to regulate the rates of professional remuneration.—5. That all architectural societies giving in their adherence at or before the first meeting, shall constitute the nucleus of the Alliance; and in future all architectural societies shall be eligible for election in the mode hereafter provided.—6. That any society wishing to join, shall be proposed, in writing, by a society already in the Alliance, through their secretary; that such proposal shall be sent to the secretary of the Alliance at least one month before the annual meeting, and shall state the title of the society proposed, and the names of its chairman and secretary. The name of the society so proposed shall be inserted in the notice convening the meeting, when the election or rejection of such society shall be decided by ballot.—7. That the business of the Alliance shall be conducted by a president, vice-president, treasurer, honorary secretary, and delegates from each society in the Alliance. The delegates shall consist of the chairman of each society in the Alliance (*ex officio*), four members appointed by the Royal Institute of British Architects, three members by the Scottish Institute, three by the Architectural Association of London, and two by each provincial society, or any less number they may see fit to appoint; all to be appointed annually. The president, vice-president, treasurer, and honorary secretary to be elected annually by ballot by the delegates. All correspondence shall be conducted by the secretary of the Alliance and the secretaries of the various societies composing it.—8. That the annual meeting shall be held on the first Tuesday in June in each year, and other meetings may be held as hereafter provided for.—9. All members of each society in the Alliance shall have the right to attend the meetings of the Alliance on introduction personally by any delegate, or by a card of introduction from one of them; but delegates only shall have the power to speak or vote.—10. Questions may be brought under the cognizance of the Alliance by any society writing, through their secretary, to the secretary of the Alliance, who shall then ascertain the views of the other allied societies and report to each the general feeling. On the requisition of a majority of the councils or committees of the various allied societies, the secretary shall call a special meeting of the delegates for the consideration of any question that may arise. To such special meetings provincial societies may send all their delegates, or one delegate with three votes, or may exercise their three votes by proxy through any other delegate.—11. That the officers of the Alliance shall prepare a report of the proceedings of the Alliance for each year, to be laid before the annual meeting, and it shall be competent for such meeting to alter or amend it, and to order it to be printed if they see fit, in which case a copy shall be sent to each member of every society in the Alliance.—12. That every society publishing a report of its proceedings, or of any paper read before it, shall present a copy to every other society in the Alliance.—13. That any member of a society in the Alliance shall have the privilege of attending (but not of speaking or voting) at the meetings of any other society in the Alliance, provided such member be introduced by letter from one of his own delegates, or personally by a member of such society.—14. That each society shall pay the expenses of its own correspondence, and shall make arrangements with its delegates as to their expenses, and the expenses of the Alliance (stationery, postage, printing, &c.) shall be borne equally by the allied societies.

MICA IN DECORATION.—An endeavour is being made to apply mica, previously coloured or metalized, to the decoration of churches, rooms, shops, frames, and other ornamental and useful purposes. The mica preserves the gilding, silvering, or colouring from deterioration, and from its transparency the articles so treated preserve all their brilliancy. Mr. Murray, of Paris, the patentee, states that he thus prepares and applies the mica:—It is first cut to the desired thickness with an ivory or steel knife; and is then coated with a thin layer of

isinglass diluted in water; and the gold or other surface is applied; after which it is allowed to dry (any article, gilt, silvered, or coloured by the known process, may be covered with a thin sheet of mica by glueing). He then takes a pattern of copper, with a design cut out on it, and places it on the reverse side of the mica; and with a small brush removes any superfluous parts, the required design thus remaining on the parts which have not been brushed. He then applies colours, either one or more times, as considered necessary, and afterwards coats the whole with a solution of liquid glue diluted in spirits of wine, which is applied for the purpose of rendering the mica pliable. When this is effected, the mica is applied to the frame or other object, which is coated with glue or other adhesive material, which is allowed to become comparatively dry. Mr. Murray then applies the mica with the design on it to the frame or other object, when it is allowed to dry for about three hours, after which all superfluous parts are removed, and the external surface of the mica made smooth. In order to make the junctions of several pieces of mica imperceptible, he first glues them together with Venetian glue, and then applies a hot iron to the parts where the mica is joined together, when the parts will be completely united. The value of mica depends upon the size of the sheets and their transparency; the clear, ruby-tinged being the finest, and the cloudy grey the least valuable. Talc resembles mica, but is brittle and crumbling. As regards the protection of decorations, it remains to be seen what such a patent is worth; considering that a good many years since the late Miss Wallace obtained a patent for effecting the very same object by means of glass. Mica itself is a kind of glass; being a silicate of potash, or identical, in chemical nature, with water glass. Many of the decorative works done by Miss Wallace were beautiful, and the brilliancy of some of them, as the writer of this has seen, continues undiminished, though many years have passed since they were done.

A VIEW ON THE THAMES FIFTY YEARS AGO.—But we spoke of what a Londoner saw from Blackfriars-bridge. There was much in addition to St. Paul's. Some fifty churches grandly grouped around the Mother Cathedral, so that, when its deep, sonorous bell struck, they all seemed to answer in dutiful cadences, making together a sublime, mysterious music, "seldom heard by mortal ear." Beyond the dense, dark brigade of dwellings, the Monument, so majestically plain and simple, shot into the sky vault; while, at its foot, old London-bridge, with absurdly small arches—the sculler's terror—spanned the impatient flood rushing from the pool, and dashing angrily against the piers. It was a tale of those days that oar-boats could not shoot safely through those vexed waters. I knew better, having watched several perform the feat with perfect impunity; and once being anxious to reach Westminster as quickly as possible, I defied the risk myself, without danger, though, as we shot the bridge, I got a cold fit, and thought it foolhardy. Looking back as we passed, however, on the endless forests of masts, the Tower pinnacles arose in the dim distance as I had often watched them from the crown of Blackfriars-bridge. Crossing to a recessed balustrade westward, there were the Temple-gardens, green and quiet, not gorgeous with chrysanthemums as now, nor rich with "roses, red and white," as in the times of the rival houses, but invested with a studious calm, strangely attractive, for they formed a peaceful oasis amidst "the gay, busy town." In succession came Somerset-house, not so sooty as it is now, but with a rough, unfinished angle, tastefully obliterated by the recent addition. What more was there, save the roof of old Drury, with its gilded Apollo; St. Martin's spire, glad to escape from the dingy Lane; and, shutting in the whole, Westminster-bridge, with its heavy span of arches, frowning on the miniature waves that playfully broke around them? Such Thames views have vanished. The silent highway brawls as noisily now as the Strand; steamboats innumerable, with stifling jets of smoke, more than out-doing the omnibus traffic of the narrower thoroughfare. —*City Press.*

BURSTING OF A RESERVOIR NEAR ROCHDALE.—The work of years at the new reservoir of the Oldham waterworks has been spoilt by the giving way of the embankment. The cause of the catastrophe is not known. In the night the lower part of one side of the embankment gave way, forcing up the superficial soil of the adjacent fields to a considerable height. The pecuniary loss will be little short of 8000*l.*, although no damage has been done to person or other property. Had the catastrophe not occurred till after the receptacle had been filled, Milnrow would have witnessed a flood equal to that of Holmfirth.

PREVENTION OF ROTTING IN WOOD.—To prevent posts and piles from rotting, the following coating has been recommended in *Hera-path's Journal*. Besides being economical, it is said to be imper-

meable to water, and nearly as hard as stone:—Take 50 parts of resin, 40 parts of finely powdered chalk, 300 parts or less of fine white sharp sand, 4 parts of linseed oil, 1 part of sulphuric acid, and 1 part of native oxide of copper. First heat the resin, chalk, sand, and oil in an iron boiler; then add the oxide, and with care the acid: stir the composition carefully, and apply the coating while still hot. If it be not liquid enough, add a little more oil.

FIRE-PROOF BUILDINGS.—A new invention to prevent fire in buildings consists in making the beams, girders, columns, and other parts employed in the construction of buildings, hollow, for the purpose of containing water and other liquid; and in connecting these beams, girders, columns and other parts, so that the water or other liquid with which they are filled may circulate therein or be renewed when required. By this means, in case of fire in the building, the main supports can never become so hot as to be injured or weakened by the results of heat.

FOSSIL MAN IN THE COUNTY OF DURHAM.—A cave, known as the "Heathery Burn Cave," near Stanhope, in Durham, exists in a deep ravine in the limestone strata, which are being worked by the Weardale Iron Company, to obtain a flux used in smelting their ironstone. The progress of the quarrying operations has laid the entrance to this cave bare; and in a deposit of sand, under four inches of the stalagmitic stone which has been formed by the dripping of water, holding lime in solution from the roof, has been discovered a human skull, as well as several hundred bones of various animals, and some bronze ornaments, as, for example, armlets, pins, &c. These have been carefully collected by an able local geologist, John Elliot, Esq., and by him transmitted to London, with a view to obtain the highest scientific opinion on this most interesting discovery. As these remains, unless some error of observation has been committed, would apparently indicate the existence of man in the county of Durham at a period of time long previous to the known historical age, the result of the investigation now going on will be watched by us with the greatest interest.

BYZANTINE DECORATIVE COLOURING.—Byzantine decorative colouring was rich and warm. Gothic flashy and gaudy, rather than warm. South Kensington appears to be duly orthodox and cold; very correct; neat; but no life; no warmth;—wholly different from twelfth-century work. Gothic windows and walls, inasmuch as colour is concerned, are all spoiled by eternal diapers, patterns, borders: there are no broad masses of colour, as in Byzantine work. By the word Byzantine we mean all Christian art before Gothic. Gothic is finicky; Byzantine manly and massive. If Byzantine had only had the pointed arch, it would have been perfect. There is life in it, and plenty of grotesque—the best signs of healthy minds. We should like to see some South Kensington grotesque: it would be interesting. Gothic form and outline are pretty elegant outline. Byzantine cares not a fig for elegance: it is noble, thick, massive, manly in form; and life is given to the form by the glorious grotesque. This may be well studied in the metal-work and furniture of the two.

In Modena a curious sepulchral monument has just been discovered by M. Cavedoni. It consists of a marble slab, forty centimètres by thirty-two (fifteen and a half inches by twelve), and was found near the sarcophagus of Turpiannia Tertia, within the courtyard of M. Pioppi's house, and at a depth of about twelve feet. It bears the Greek word "syntrophion," and below seven round loaves arranged in a straight line, and marked each with a cross, and lying between two fishes, each of which has seized the loaf nearest it. This monument is evidently of Christian origin, and probably of the third or fourth century.

REMEDY FOR DAMP WALLS.—Damp walls may result from a variety of causes. Sometimes it arises from the stone of the building attracting moisture unduly—an evil only to be prevented in the building of new houses by a layer of sheet lead, of blue slate, stone carefully set in cement, or of cement only, of the thickness of the wall, and above the surface of the ground on which the building stands; thus forming a stratum which must effectually repel any water that might otherwise appear. Other dampnesses are occasioned by condensation of the water generated by the atmosphere in the form of vapour, and condensed by coming in contact with surfaces lower in temperature. A stone wall is colder than a lath and plaster partition, and will always be damper. The remedy would be to lath and plaster on battens fixed against the stone work, so as to prevent the stucco coming into immediate contact with the stone; it would then be as dry as any other part of the house. Dark paper-hangings are much

drier than light ones; the reason being that all dark colours imbibe more light and heat, and thus maintain a higher temperature. Frequently walls, in addition to being damp, become covered with a species of salt, presenting the appearance of hoar-frost. The following process will be found an excellent remedy for this inconvenience and disfigurement:—Take four pounds of commercial carbonate of soda, two pounds and a half of pearl-ash, and two pounds and a half of finely sifted silver sand; mix these well together, and put them into a crucible capable of containing three times the quantity; fuse for two or three hours, pour it out on a stone or iron slab, and allow it to cool; then boil it in about a gallon of water, until a saturated solution is obtained. Let the salt be scraped off the wall as much as possible, and washed well with warm water; then brush the hot solution prepared as above on all parts of its surface. Give the wall another coat in three days' time, and at the end of a week or two the wall will be covered with an impervious glassy coating, which will effect the desired end. This will answer the purpose for a wall that is merely damp.

PRESERVING TIMBER.—An experiment has been made at Cherbourg, in preserving wood for vessels from being affected with dry rot, by subjecting the timber to a slight carbonization with common inflammable coal-gas. The cost is only about ten cents per square yard of framing and planking, and the result is stated to be completely successful.

NEW DRINKING FOUNTAIN AT CAMBERWELL-GREEN.—A new drinking fountain has been erected at Camberwell-green. It is the gift of Miss Caroline Edwards and the Metropolitan Free Drinking Fountain Association, and has been erected under the superintendence of that society. It is supported by four columns of serpentine marble, resting on a square solid pedestal. Under a dome four jets of water spring from the centre. The design is by Mr. Rolles, the surveyor to the association. This makes the eighty-sixth fountain which the association, with the well-known philanthropist, Mr. Samuel Gurney, at their head, has opened in London, and by the 1st July it will open eighteen more.

CHURCH-BUILDING NEWS.—*Bradford:* The Primitive Methodist Chapel, in Manchester-road, has been rebuilt; the old chapel having been accidentally burnt down. The new chapel has been built from a design by Mr. Ogilvie, architect. The liabilities incurred by the rebuilding amounted to 1454*l.*—*Southport:* The foundation-stone of a new church, at Ecclesfield, Southport, has been laid by Lord Skelmersdale. The church, which is to be dedicated to St. Paul, is situate close to the boundary line, between Birkdale and Southport, and when complete will have cost 4400*l.* The style of architecture is the Early Decorated. It will consist of a nave, north and south aisles, transepts, and chancel; the last having north aisle as chapel, and south aisle as vestry and organ-loft. The architects are Messrs. Speakman and Charlesworth, of Manchester; and the contract has been let to Messrs. Ellis and Hinchcliffe, of Manchester, for 4390*l.*

NOTICE TO CORRESPONDENTS.

In the execution of the Plates which form our Illustrations, we hope always to have the advantage of the designs of the Architects whose buildings we represent. We also invite those gentlemen, in every instance, to communicate both with our artists and ourselves during the progress of our drawings, and we shall always be anxious to secure their approval for every illustration on its completion.

The lithographs contained in the present Part have all been executed from the original drawings of the Architect, and also from his working drawings, with the additional aid of photography; and they will doubtless be preserved and valued as faithful pictures of an interesting public monument, and a chaste example of the street architecture of London in the Victorian age.

All communications for the Editor to be addressed to the care of DARTON AND HODGE, Publishers, Holborn-hill, E.C.

SIR CHRISTOPHER WREN.



THE same year which witnessed the death of the great Gustavus—that lion of the Protestant Faith—upon the blood-stained field of Lutzen, witnessed also the birth, in the quiet Rectory of East Knoyle, in Wiltshire, of the greatest of British architects. This same year was, moreover, memorable in many other respects. The time was big with wars and revolutions—national calamities and dynastic disasters. Charles I. was then actively engaged in those suicidal measures which caused his head to roll upon the scaffold at Whitehall, and his family to linger in a painful exile. In that year he made Wentworth, afterwards the Earl of Strafford—he of the “thorough policy”—his Deputy of Ireland. For the purpose of raising money a number of trade monopolies were created, and lords and gentlemen, on pain of the royal displeasure, were commanded to reside upon their own estates; and Councillor Sherfield was prosecuted for breaking a window of Salisbury Cathedral, on which said window was painted the history of the Creation. For this indulgence of his anti-popish zeal the worthy Councillor was mulcted in the sum of 500*l*. In the same year a Court of Chivalry was erected for a trial of combat between two fiery Scots—hight Lord Rea and David Ramsay. Nothing, however, came of the affair, for the King interposing, the belligerent Scots were under the necessity of suppressing their wrath, or else of gratifying their mutual animosity by some other method. Oxford then, as now, was troubled with the heretical outbreaks of some of her sons, for we find that three of her doctors were expelled for preaching against Arminianism; and Mount Vesuvius, as if determined to throw a lurid and appropriate light upon such mad and foolish doings, threw forth its flames and lava in such copious streams as to destroy 4000 people, and lay waste an immense extent of country.

To those curious as to striking coincidence, it may be agreeable to be told that in the year preceding the birth of Wren—that is, in 1631—no less a sum than 100,000*l*. had been collected in the City of London towards the repairing and adorning of the old cathedral of St. Paul's.

Regarding the year of Sir Christopher's birth there have been some conflicting statements; but all his biographers are now agreed that it took place on the 20th of October, 1632. His father was, besides being Chaplain in Ordinary to King Charles, Dean of Windsor and Rector of East Knoyle. The Wrens, who claimed to be of a Scandinavian stock, were all of them sturdy royalists, and generally contrived to have a reasonably good share of the State and Church loaves and fishes.

The uncle of the subject of our memoir was the well-known Dr. Matthew Wren, successively Bishop of Norwich, Hereford, and Ely. Than this same Bishop, Oliver Cromwell had not a more fierce and implacable enemy. His devotion to the Crown cost him twenty years' imprisonment in the Tower. This long incarceration

tion, however, was the result rather of his own obstinacy than of any desire on the part of the great Protector to deprive him of his liberty. It was this faithful Churchman who composed the form of prayer used on the 29th of May, in commemoration of the happy restoration of royalty to these realms. He is also remembered as having built the chapel of Pembroke Hall, Cambridge, of which his nephew, Christopher, was the architect.

Young Wren, the future architect of St. Paul's, was a delicate infant; his first education was therefore conducted at home. He was afterwards sent to Westminster School, then presided over by the celebrated Dr. Busby. From Westminster school he went to Wadham College, Oxford. This was in his fourteenth year; but long before he arrived at this age the extraordinary intellectual powers of Wren were the subject of remark and astonishment to all his acquaintances; in fact, the future architect of St. Paul's was a perfect prodigy of precocious mental ability. When little more than a mere child, Aubrey, the Wiltshire antiquary, described him as a “youth of prodigious inventive wit.” When no more than thirteen years of age he invented an astronomical instrument, a pneumatic engine, and another very ingenious instrument for use in practical gnomics. At fourteen he was presented to the Elector Palatine, who then paid a visit to Oxford, as “a prodigy of science.” These rich promises of Wren's boyhood were amply fulfilled by the performances of his manhood. Indeed, it is no exaggeration to assert that Sir Christopher Wren was one of the greatest geniuses, as a mathematician and mechanician, that ever lived. This is a bold statement, but one which is abundantly warranted by the facts of the case. The bare mention of a few of his mechanical and scientific inventions, when quite a young man, will substantiate his right to this high praise. Amongst these inventions are—

1. Hypothesis of the moon's libration in solid.
2. A new projective gonioscope.
3. To find if the earth moves.
4. The weather-wheel.
5. The weather-clock.
6. Perpetual motion, or weather-wheel and weather-clock compounded.
7. Balance to weigh without weights.
8. To write in the dark.
9. To write double by an instrument.
10. A scenographical instrument to survey at one station.
11. Several new ways of graving and etching.
12. To weave many ribbons at once with only turning a wheel.
13. Divers new engines for raising water.
14. A pavement harder, fairer, and cheaper than marble.
15. A way of embroidery for beds cheap and fair.
16. New ways of printing.
17. Pneumatic engines.
18. New designs tending to strength, convenience, and beauty in buildings.
19. Divers new musical instruments.
20. New ways of sailing.

21. Best way for reckoning time, way, and longitude at sea.
22. Probable ways for making fresh water at sea.
23. Fabric for a vessel of war.
24. To build forts and moles in the sea.
25. Inventions for making and fortifying havens, clearing sands, and to sound at sea.
26. Ways of submarine navigation.
27. New offensive and defensive weapons.
28. Easier ways of whale-fishing.
29. Secure and speedier ways of attacking forts by approaches and galleons.
30. Some inventions in fortification.
31. To pierce a rock in mining.
32. To alter the mass of living matter by injection into the blood.
33. To measure the basis and height of a mountain only by journeying over it.
34. To measure the straight distance by travelling the winding way.
35. A compass to play in the coach or the hand of the rider.

But Wren was something more than a splendid mathematical and mechanical genius; he was also a classical scholar of more than average attainments. He was in the habit of writing Latin descriptions, both in prose and verse, of his university studies. In his sixteenth year, at the suggestion of Sir Charles Scarborough, a profound mathematician, he translated Mr. Oughtred's work on Geometrical Dialling into Latin. In 1647, when only in his fifteenth year, he became Demonstrating Assistant on Anatomy at Surgeons' Hall to his friend and patron, Dr. Sir Charles Scarborough. In the very exultant letter which he penned to his father on this occasion, he mentions an invention of a weather-clock, and also of an instrument for writing in the dark. 1647, being his fifteenth year, is a remarkable epoch in the unfolding of Sir Christopher's mind. In that year Pope Innocent X. proclaimed to the whole world the completion of the Cathedral of St. Peter. In England, though a Protestant country, this event, as it did throughout the other nations of Christendom, produced a considerable sensation, and it is no more than reasonable to assume that on a mind so sensitive and observant as Wren's, it had the effect of inciting him to a closer intimacy with the arts of design. To his ability as a mathematician and designer is attributable the fact that the idea and plan of St. Paul's is the sole creation of his own inventive mind, whereas St. Peter's was the work of more than twenty architects, supported by the treasure of the whole Christian world, and the authority of the Roman Pontiffs in the full plenitude of their power, and during the reigns of nineteen successive Popes.

In a notice like the present we cannot give a detailed description of Wren's rapid advancement to the lofty eminence to which he ultimately attained. All that our limited space permits us to do is to indicate the principal stages or landmarks in his long and luminous career.

In 1653 he took his degree of Master of Arts at Oxford University. In the same year he was chosen Fellow of

All Souls' College; two years after he was chosen Professor of Astronomy at Gresham College, London. In 1660 he was elected Savilian Professor of Astronomy, Oxford. His inaugural address on this occasion shows that his conception of the claims of astronomy is commensurate with the majesty of the imperial science. In 1661 he received the degree of LL.D.; in 1663 he was elected Fellow of the Royal Society; in 1665 he travelled in France to examine the most beautiful specimens of architecture in that country; in 1666 occurred that memorable and terrible event which gave full play to the magnificent constructive powers which Wren received from the Divine Architect of the Universe. This event was no other than the Great Fire of London. From the descriptions of several competent eye-witnesses we have a vivid picture of that awful and sublime conflagration. Probably the best accounts of the Great Fire are those given by the pens of Samuel Pepys and John Evelyn. From these we learn that on the night of Saturday the 1st, or the morning of Sunday, September 2nd, 1666, burst forth that awful fire which cleared the field for the exercise of Wren's genius. On that morning Mr. Pepys was roused from his sleep, and informed that a great fire had broken out. Mr. Pepys then lived in Seething-lane, by the Tower. By the appearance from his window he conceived this fire to be in the neighbourhood of Mark-lane. Shortly afterwards he was told that more than three hundred houses were then burning down all Fish-street towards London-bridge. Pepys hurried to the Tower, and from the summit of one of its highest turrets beheld the houses at that end of the bridge all on fire, which raged fiercely on both sides. The Lieutenant-Governor of the Tower informed Mr. Pepys that the fire had begun at Faryner's, the King's baker, in Pudding-lane, and had already burnt down St. Magnus's Church and the greater part of Fish-street. Mr. Pepys then took a boat, passed through the bridge, saw the fire extending to the Old Swan, and before he left, the warehouses in the Steel-yard were on fire. The consternation of the citizens was dreadful, their confusion indescribable. Every one was endeavouring to remove his goods, some in their despair rolling or pitching them into the river, others putting them into lighters; many poor people stayed in their houses till driven out by the flames, then they rushed into the boats, or dropped or jumped from their windows into the water. The curious and indefatigable Mr. Pepys went by river to Whitehall, saw the King and the Duke of York, told them of the terrible progress made by the fire, and obtained from his Majesty an order to the Lord Mayor to spare no houses, but to pull them down in every direction, in order to isolate the fire. But nothing effectual came of all this—the conflagration could not be arrested. The whole city was in flames, burning from Cheapside to the Thames, all along Cornhill, Tower-street, Fenchurch-street, Gracechurch-street, almost to the Tower; westward to Baynard's Castle, and northward to St. Paul's Cathedral, the burning of which was increased, if not caused, by the scaffolding erected by the Commissioners for its proposed reparations. The people were so petrified by terror and astonishment, that they hardly made any efforts to stop or

quench the fire. "There was nothing heard or seen but crying out and lamentation," the citizens running about like distracted creatures. The scene was sublime in its terrible splendours. "The sky," says Evelyn, "was of a fiery aspect, like the top of a mighty burning oven, and the light was seen above forty miles round for many nights, and the air appeared ignited by the preceding hot and sultry summer, which had prepared the materials to conceive the fire which devoured houses, churches, public halls, the Exchange, hospitals, monuments, ornaments, furniture, goods, and everything that came in its way. The noise and cracking and thunder of the impetuous flames, the shrieking of women and children, the hurry of people, the falling of lofty towers, houses, and churches, were like a hideous tempest, while the atmosphere was so hot as to be almost unbreathable." "God grant mine eyes may never again behold the like," writes the pious Evelyn, who now saw ten thousand houses all in one flame.

This fire, which began on the 2nd of September, raged with unchecked vehemence till the 8th. On the 10th, the greater portion of the City of London was but a heap of blazing embers; but on the 12th Evelyn laid before the King a survey of the ruins, a sketch for the new city, and a dissertation on the best mode of performing so large a work. Hook also presented a model for rebuilding the new city, which model received the approbation of the Lord Mayor.

Wren, with his accustomed alacrity, and in accordance with the duties of his office, commenced a plan for building a new city on the site of the old one, and presented it to the King and Council some days before that of Hook. This caused some unpleasantness in the Royal Society, of which both Hook and Wren were distinguished members. The members of the Society complained that Wren's plan had not been first submitted to them. Wren replied that he was so pressed for time that he could not possibly afford to consult his brother members, before submitting the design to his Majesty. The plea was accepted, and the offended pride of the Royal savans appeased.

It may be necessary here to state that some years anterior to this event of the Great Fire, Wren had been consulted, and indeed engaged on the work of the repair and restoration of "Old" St. Paul's. This fine Gothic structure, which had its foundations laid towards the close of the eleventh century, and which was the scene of some of the most striking historical spectacles witnessed in England through the course of five eventful centuries, was during the Civil Wars subjected to almost every conceivable species of degradation and insult. Its revenues had been seized, its ministers expelled, its monuments destroyed, or their inscriptions obliterated, saw-pits were dug in various parts of its enclosure, and the Cromwellian horse stabled within its venerable choir. The reparation of this sacred edifice was one of the principal objects which occupied the mind of Charles II. after his restoration to the throne of his fathers. Wren and his friend Evelyn were members of the Royal Commission appointed to direct and superintend the execution of this work of restoration. The "great fire," however, as we have seen, put an end, or

rather gave a new direction to the operations of these "Commissioners." On the 12th of September, Evelyn laid before the King a survey of the ruins, and a sketch of the proposed new city. The plan of Wren was of much more comprehensive nature; part of that magnificent plan, which has even yet to be realized, was that a grand quay or esplanade—that is, a regular "Thames embankment"—should be formed along the river, from the foot of London Bridge to the Temple. This quay was to be 40 feet in width between the river and the houses on its banks. This noble idea, which originated in the fertile mind of Wren, and which would have rendered London the finest as well as the greatest city in the world, is now, after the lapse of nearly two hundred years, in a fair way of being carried into effect.

To Wren, whose scientific genius all Europe acknowledged, and whose architectural ability was made known to the nation by his designs of Pembroke College, Cambridge, and the Sheldonian Theatre, Oxford, was entrusted the plan of the new St. Paul's. The first stone of the present cathedral was laid on the 21st of June, 1675, by the architect himself, assisted by Thomas Strong, his master mason; and the second stone by Mr. Longland. "In the beginning of the new works of St. Paul's," writes Wren himself, "an incident was taken notice of by many people as a memorable omen; when the surveyor (that is Sir Christopher) in person had set out upon the place the dimensions of the great dome, and fixed upon the centre, a common labourer was ordered to bring a flat stone from the heaps of rubbish (such as should first come to hand) to be laid for a mark and direction to the masons; the stone, which was immediately brought and laid down for that purpose, happened to be a piece of gravestone with nothing remaining of the inscription but this single word, in large capitals, 'RESURGAM' (I shall rise again)." This seemingly trivial incident made a deep impression on the mind of the architect, as may be seen by the decorations of the pediment over the northern portico, where an exquisitely-sculptured Phoenix rising from the flames, with the motto "Resurgam" has been placed; and St. Paul's has indeed risen again in almost perfect beauty and grandeur. It is beyond all doubt one of the noblest places of worship ever reared by the hand of man. For dignity and elegance, and simple majesty of form, no church in Europe can compare with it. On this matter, in spite of all our respect and even reverence for Ruskin, we cannot help asserting that he has been grossly, though unconsciously, unjust to Sir Christopher Wren, to St. Paul's, and to himself. In depreciating the architectural qualities of St. Paul's, the author of the "Stones of Venice" has shown that the taste and judgment of the ablest men may be perverted by a too exclusive devotion to one particular object of admiration. In Mr. Ruskin, as in many other great and good men, earnestness has degenerated into intolerance; his worship of the Gothic has assumed the aspect of a fanatical and even ferocious hatred to every other style of architecture. But the reputation of Wren has nothing to apprehend from the disapprobation of Ruskin. The Gothic, with all its undoubted, and we will

say paramount, merits, does not monopolize the whole of the beautiful; other forms of architecture have a glory of their own; and as long as the human mind is constituted as it is, the chasteness and simplicity of the Greek, the strength and grandeur of the Roman styles of building, will share its admiration in common with the charming variety, the wondrous flexibility, and the suggestive symbolism of the Gothic. It is right that it should be so. In æsthetics, as in theology, sectarianism is hostile to the spirit of true worship. The forms of the beautiful are as infinite as the Deity, whose garment it is. We admire the redness of the rose without despising the paleness of the lily. In the same manner, a feeling of religious veneration for the sublime beauties of Westminster Abbey is not incompatible with a deep, heartfelt admiration for the massive majesty of St. Paul's. But for the appreciation of the manifold beauties of this masterpiece of Wren's, no scientific guidance or special instruction is required; all that is wanted is an open sense and an unsophisticated mind. Given these, and not even the eloquent depreciation of Ruskin multiplied ten thousandfold can prevent the mind from experiencing a satisfied and solemnizing sensation from the appearance of the greatest and finest church ever reared for the celebration of Protestant worship. But beautiful as the great cathedral of the metropolis is, and though it is justly considered next in rank after St. Peter's, of Rome, the genius of Wren must not be estimated wholly from it as it exists. His original and favourite plan was one in the form of a Greek cross, and of a single order of height, with a dome as large as that of St. Peter's. The form of the Latin cross and the screen wall were modifications forced upon him by the imperious bigotry of the Duke of York, afterwards James II., who conceived that with these deviations from the simplicity of the original design, St. Paul's would be better fitted for the performance of the ceremonial of the Romish worship, which he contemplated re-establishing. Sir Christopher Wren, though distinguished for exterior calmness and the power of suppressing emotion, is said to have shed tears of vexation because of this marring of his first idea. St. Paul's took thirty-five years in being built, and its last stone was laid by the son of the architect, Christopher Wren the younger, an eminent antiquary and estimable gentleman. Wren's practice as an architect was, perhaps, the most extensive ever enjoyed by one man. The whole of the buildings which he deigned cannot now be determined, but the subjoined chronological list of some of his works will enable us to form an idea of the truly Herculean character of his labours.

*Chronological List of the Principal Buildings planned by
Sir Christopher Wren.*

- 1663. Pembroke College Chapel, Cambridge.
- 1664-69. Sheldonian Theatre, Oxford.
- 1664. Buildings at Trinity College, Cambridge.
- 1666. Library ditto ditto
- 1667. Royal Exchange, London.
- 1668-77. Emmanuel College Chapel, Cambridge.
- 1668. Custom House, London.

- 1670. Temple Bar.
- 1670-74. St. Sepulchre's, Newgate.
- 1671-78. Spire and Church of St. Mary's-le-Bow.
- 1671-86. St. Lawrence, Jewry.
- 1672-79. St. Stephen's, Walbrook.
- 1672. St. Michael's, Cornhill.
- 1672. St. Mary's-at-Hill.
- 1673. St. Bennet Fink, Threadneedle-street (dome now taken down).
- 1674-98. College of Physicians, Warwick-lane (now converted into a market).
- 1675. St. Paul's (finished 1710).
- 1675. Royal Observatory, Greenwich.
- 1680. St. Bride's, Fleet-street; also St. Swithin's.
- 1681-82. Gateway Tower, Christ Church, Oxford.
- 1682-90. Chelsea Hospital.
- 1682. St. Antholine's, Watling-street.
- 1683. The Palace at Winchester (left unfinished, now a barracks).
- 1683. Ashmolean Museum, Oxford.
- 1683. St. James's, Westminster.
- 1683-86. St. Clement's, Eastcheap.
- 1684. St. Martin's, Ludgate.
- 1684. Made Controller of Works at Windsor Castle.
- 1686. St. Andrew's, Holborn.
- 1687-1704. Christ Church, Newgate.
- 1690. Hampton Court.
- 1692. Morden College, Blackheath.
- 1696. Greenwich Hospital.
- 1698. St. Dunstan's in the East (tower and spire).
- 1703. Buckingham House, London (now taken down).
- 1709. Marlborough House, London.
- 1713. Towers of West Front of Westminster Abbey.

Wren was never less happy than in his design of Hampton Court. For this, however, the King and not the architect was to blame. William III., though a brave soldier and wise statesman, was not pre-eminent for his good taste in the fine arts. He had, however, what was much better, the courage and the love of truth which would not allow him to hear the architect blamed for the faults of his master. Thus when some of his courtiers found fault with the lowness and disproportionate arrangement of the cloisters or arcade below the royal apartments at Hampton Court, William at once declared that they had been so constructed by his express command. After this royal declaration the courtier censors of the great architect found no further fault with the low cloisters and heavy appearance of Hampton Palace.

Next to St. Paul's, the two most important of Wren's national buildings are Chelsea and Greenwich Hospitals. The latter of these noble institutions is in Wren's best style. Any one who looks on that splendid pile stretching along the bank of the Thames, will perceive at once that it is the work of the same mind which conceived St. Paul's Cathedral; the domes seem facsimiles, and much of the details carry on the resemblance. For his plan of Greenwich Hospital Wren refused to accept any remuneration, deeming it a sufficient reward for his services to have the

honour of contributing towards the payment of the debt of gratitude which England owes to her matchless ocean warriors.

The life of this truly great and good man spanned a period of seven reigns. He was seventeen years old when the unfortunate Charles I. was beheaded. He was known to and highly esteemed by Oliver Cromwell. Charles II., who, whatever his defects may have been, had the faculty of knowing a great man when he met one, did honour to himself by bestowing his confidence on Sir Christopher Wren. James II., though he thwarted the intention and marred the noblest of his designs, could not but admire the genius of the architect of St. Paul's. In the estimation of William and Mary he stood higher than in the estimation of any of their predecessors. He was at least equally honoured by Queen Anne and her Ministers. As for George I., there is not a blacker spot on the character of his inglorious reign than the treatment to which in his name Wren was exposed. His enemies, by his own intrepid integrity and the indignant voice of the nation, were defeated in their mean and malignant attempt to deprive him of the very inadequate and even paltry amount of money assigned to him for his labours in connexion with St. Paul's. Still they indulged in the hope of revenge, and their day of triumph was, unfortunately for the honour of their country, not far distant. Queen Anne was succeeded by one who could not feel the worth and genius of the great architect. "The first king of the House of Brunswick, a coarse and vulgar man in all respects, seems from the beginning to have looked with an evil eye on Wren. The great architect had a high spirit. He maintained the erect dignity of genius, and demeaned himself more as might become a man of talent at the elegant Court of the first Charles, than like a shrewd worshipper of fortune in the days of the first George. His reserve was misunderstood or misrepresented:—

Too poor for a bribe, and too proud to importune,
He had not the method of making his fortune,

and this fall was predicted long before it happened."* The King, who could not be expected to know personally much of Wren, was told that he was stiff, opinionative, self-sufficient, untractable, and withal, not over loyal to the new dynasty. On the other hand, a young and supple quack, by name Benson, an architect without either talent or science, was extolled as a second Palladio. The Germans all joined in this Benson's praise, and the result was, that in 1718, Sir Christopher Wren, in the eighty-sixth year of his age, and the forty-ninth of his office as Surveyor-general to the royal buildings, was dismissed ignominiously, and the smooth pretender Benson installed in his place. The whole nation was indignant at this most gross and disgusting job, and the boldest and foremost men in the country cried shame upon the infamous intriguers who had succeeded in passing this slight upon one of the noblest of England's sons. Seward and Walpole, and Pope and Steele, gave tongue to the deep and heartfelt feeling of indignant disgust which was entertained by the whole community.

* Cunningham's "Life of Wren."

Wren, however, seems to have been much less affected than his friends, The income of which it deprived him he disregarded; for there was nothing mean or sordid in his nature, and he had thought but little of money in the days when he could have it showered upon him from king and noble. He betook himself to a country retirement at Hampton Court, where he had a house on lease from the Government. There, in addition to his study of the Scriptures, he delighted himself with a reconsideration of his thoughts for the discovery of the longitude at sea, and dipped now and then with something of his juvenile ardour into mathematics and astronomy. But his chief pleasure lay in coming occasionally to London to inspect the progress of the repairs of Westminster Abbey—where in a moment when bad taste prevailed against the usual correctness of his judgment he had directed the western towers to be restored in mingled Grecian and Gothic—and in visiting St. Paul's, "a fabric," says Walpole, "which one cannot wonder left such an impression of content on the mind of the good old man, that being carried to see it, it seemed to recal a memory that was almost deadened to every other use."

Until very near the close of his life the vigour of his mind remained quite unimpaired. His decay was gradual. Death worked his mission on the good and brave old man by gentle and almost imperceptible degrees. The limbs of Wren were the first to fail. His end was hastened by a cold which he caught in journeying between London and Hampton Court. He died, free from pain and in perfect peace with all men, on the 23rd day of February, 1723, in the ninety-first year of his age. He was buried in the vault of St. Paul's Cathedral, with an inscription of four memorable words, which though they point to the greatest of his works, do not embody the entire greatness of his mind:—

Si monumentum quaeris, circumspice.
(Wouldst thou see his monument? Look around thee.)

Such is a brief outline of the life and achievements of one of the greatest Englishmen that ever lived—a man whose intellect even those who have most vehemently depreciated his works admit to have been stupendous, and worthy to take rank beside that of Michael Angelo, and whose morals passed pure and unstained through a black sea of unprecedented pollution; for it was the fate of Wren to have lived through the foulest period of English history. But panoplied in his love of science, and his unflagging faith in the eternal verities of revealed religion, the prevailing impurity could not touch the texture of his soul, far less impart a stain to it.

The personal appearance, we are told, was highly prepossessing. He is recorded to have been of low stature, his forehead broad and fair, his nose slightly aquiline, the eyes large and expressive, and the whole aspect stamped with intelligence and dignity. He was light and active of body; he walked with a certain stableness of air, and his constitution, which was rather delicate, was, it is said, saved from consumption by habits of temperance and regularity. That he was short of stature, a tradition preserved by Seward sufficiently shows. Charles II., on walking through his newly erected hunting palace at

Newmarket, said, "These rooms are too low." Wren, who was present, went up to the King and replied, "And please your majesty, I think them high enough." Whereupon Charles, stooping down to Sir Christopher's stature, answered, with a smile, "On second thoughts, I think so too."

Wren was twice married; first to a daughter of Sir John Coghill, and second to a daughter of Viscount Fitzwilliam, an Irish peer. His son, by the first marriage, Christopher Wren, already referred to, sat in Parliament for Windsor, and was the principal author of the "Parentalia, or Memoirs of the Family of the Wrens." This work, which the son of the architect left unfinished, was completed by the grandson, and given to the world in 1750. The great architect, in addition to having been knighted, had the honour of being elected President of the Royal Society, and of being chosen to represent successively Plymouth and Melcombe Regis in the imperial legislature. He was also one of the Commissioners of Chelsea College. In conclusion, it may be here stated, that all that the despicable Benson derived from his displacement of Wren was, with the exception of the paltry salary, a dismissal at the end of about a twelvemonth for gross incompetency, and a condemnation to everlasting fame in the scathing verse of Pope's immortal satire.

MARBLE APPLIED TO BUILDING AND ORNAMENTAL PURPOSES.

THERE is no variety of stone with which our ideas of beauty and utility are so closely associated as that of marble. Our thoughts of grandeur and magnificence are centered in "marble halls;" for ornamental purposes, whether in a floor or mantelpiece, we think of nothing but marble, and the choice and enduring works of the sculptor's art, in which genius has rendered its efforts immortal, are preserved for us in this plentiful and beautiful material. Paint fades with time, the canvas decays, the book will perish; but the artist who toiled on the Venus de Medici, although his name be forgotten, has left the divine form upon which he laboured still uninjured by the centuries which have passed over it, simply because he worked in Parian marble. We propose in this article to give a brief, popular sketch of the varieties of marble in this and other countries, as well as some general idea of its use for the erection and adornment of buildings, both public and private, and also for artistic purposes.

Consider, then, first, what marble seems to have been made for. Over the greater part of the surface of the world, we find that a rock has been providentially distributed, in a manner particularly pointing it out as intended for the service of man. Not altogether a common rock, it is yet rare enough to command a certain degree of interest and attention wherever it is found, but not so rare as to preclude its use from any purpose to which it is fitted. It is exactly of the consistence which is best adapted for sculpture—that is to say, neither hard nor brittle, not flakey or splintery, but uniform, and delicately

yet not ignobly soft—exactly soft enough to allow the sculptor to work it without force, and trace on it the finest lines of finished forms, and yet so hard as never to betray the touch, or moulder away beneath the steel; and so admirably crystallized, and of such permanent elements, that no rain dissolves it, no time changes it, no atmosphere decomposes it. Once shaped it is shaped for ever, unless subjected to actual violence or attrition. This rock, then, is prepared by Nature for the sculptor and the architect, just as paper is prepared by the manufacturer for the artist, with as great—nay, with greater—care and more perfect adaptation of the material to the requirements. And of the marble paper some is white and some coloured, but more is coloured than white, because the white is evidently meant for sculpture, and the coloured for covering large surfaces.*

In the following pages we shall use the term marble in the sense in which it is employed by architects and sculptors rather than in the sense in which it is used by the mineralogists. With us it is applied to all stones harder than gypsum, which are found in large masses and are susceptible of a good polish. On this principle, under the head of marble, are included many varieties of limestone, porphyry, and even granite and fine-grained basalts. But with mineralogists, the word is used in a much more restricted sense, and is confined to such varieties of dolomite, and compact, and granularly foliated limestone, as are capable of receiving a good polish.

Marble, then, assumes almost every variety of colour and texture. It is sometimes white, black, grey, green, blue, and spotted, according to the source from which it is drawn, or the circumstances under which it was found. De Costa, in his "Natural History of Fossils," gives a large catalogue of marbles disposed in methodical order; the following is an abridged analysis of his classification:—

Division I.—Marbles of One Plain Colour.

Section 1. Black marbles; most of these contain bitumen, and are foetid when bruised.

Examples.—The Numar marbles; the marbles of Ashford, in Derbyshire; Dent, in Yorkshire; near Crickhowell; Tenby; Kilkenny, &c. The marbles anciently called Marmor Luculleum, and now Nero Antico.

Section 2. White marbles.

Examples.—The marbles of Paros, in which the Laocoon and Antinous are executed; the Carrara marble of finer grain, much used in modern sculpture; the Skye marble, noticed by Dr. McCulloch; that of Inverness, Assynt, Blair Athol, &c. &c.

Section 3. Ash and gray marbles.

Examples.—A beautiful marble of compact oolitic texture, at Orelton, near the Clee Hills, in Shropshire, deserves mention.

Section 4. Brown and red marbles.

Examples.—The Rosso Antico; a rival to which, at

* "Stones of Venice," vol. iii. p. 27.

least in colour, has been found on the estate of the Duke of Devonshire, near Buxton. The mottled brown marble of Beetham Fell, near Milnthorp, is of good quality.

Section 5. Yellow marbles.

Examples.—The Gallio Antico. Siena marble, also dug at Mafra, near Lisbon. That used in ancient Rome is said to be from Numidia.

Section 6. Blue marbles.

Examples may be found near St. Pons, in Languedoc.

Section 7. Green marbles.

Example.—The Marmor Lacedæmonicum of Pliny. It is found near Verona.

Division II.—Marbles of Two Colours.

Section 1. Black marbles variegated with other colours.

Examples.—The quarries near Ashburton and Torquay, in Devonshire; Bianco e Nero Antico; the African Breccia of the ancients, Giallo e Nero Antico.

Section 2. White marbles variegated with other colours.

Examples.—Marble imported from Italy. Marbles of this general character are found in Siberia, at Plymouth, at Killarney, and in Sweden.

Section 3. Ash-gray marbles variegated with other colours. These are very numerous, and occur in various parts of Europe.

Section 4. Brown and red marbles variegated with other colours.

Section 5. Yellow marbles variegated with other colours.

Section 6. Green marbles variegated with other colours.

Examples.—Egyptian marbles. The Marmor Tiberium and Augustum of Pliny; some Verde Antico, as that dug near Susa, in Piedmont; the beautiful marble of Anglesea, called Mona marble, and that also of Kolmerden in Sweden.

Division III.—Marbles Variegated with many Colours.

Examples.—Some of the Plymouth marbles; the beautiful Brocatello, or brocade marble of Italy and Spain.

Division IV.—Marbles containing Shells, Corals, and other Extraneous Bodies.

In this last division of marbles the British islands are exceedingly rich. Some of the Plymouth, Ashburton, and other Devonian limestones are exquisitely beautiful, from the number of fine corals which are preserved in them. Splendid examples of the carboniferous limestone may be found in the crinoidal marbles of Flintshire, Derbyshire, and Gardsdale in Yorkshire; the shell marbles from the oolite rocks are also very fine, and were used extensively by the architects of the Middle Ages. But amidst all this profusion of Nature we regret to add that the working of the English marble quarries is costly, and that the use of this beautiful material amongst us is in consequence very limited.

It is not necessary for us to pursue this subject by

enumerating every kind of marble that has ever been found, since this would be an unnecessary and almost endless task. Sir George Head says that he saw in Rome a collection of varieties of marble in pieces of the size of a chessboard, or somewhat bigger, no less than four hundred and eighty-eight specimens, all arranged in proper order.

Marble, then, is the paper which Nature presents to the architect and artist, on which they may expend their genius and raise enduring monuments to their fame. Now, if we take Nature at her word, and use this precious paper which she has taken so much care to provide for us (it is a long process, the making of that paper, the pulp of it needing the subtlest possible solution, and the pressing of it—for it is all hot-pressed—having to be done under the sea, or under something at least as heavy); if, I say, we use it as Nature would have us, consider what advantages would follow. The colours of marble are mingled for us just as if on a prepared palette; they are of all shades and hues (except bad ones), some being united, and even some broken, mixed, and interrupted, in order to supply as far as possible the want of the painter's power of breaking and mingling the colour with the brush. But there is more in the colours than this delicacy of adaptation; there is history in them. By the manner in which they are arranged in every piece of marble, they record the means by which that marble has been produced, and the successive changes through which it has passed. And in all their veins and zones the flame-like stainings, or broken and disconnected lines, they write various legends, never untrue, of the former political state of the mountain kingdom to which they belonged, of its infirmities and fortitudes, convulsions and consolidations, from the beginning of time.

It is hardly possible, perhaps, for us to ascertain the precise localities of the most famous marble quarries of the ancients. They must have been numerous, since a vast quantity of the material was used by both architects and sculptors. The following were the principal varieties in request by both Greek and Italian artists.

Parian Marble (Lychnites of the ancients) is of a yellowish-white colour. The texture is fine and scaly, the scales shining and placed in all directions. The ancient artists, Διῶνυς Scyllis, Malus, and Micciades employed it; they called it lychnites, because the quarries, it is said, were wrought by lamp-light. Several of the principal statues that have come down to us, (amongst others, the famous Venus de Medicis,) are made of Parian marble.

The Pentelic Marble, from Mount Penteles, near Athens, supplied the material for most of the public monuments of Athens; the Parthenon, the Propylea, and the Hippodrome were built of it. It is more dense and finer-grained than the Parian, and sometimes exhibits faint greenish zones, produced by talc. The Torso, Discobolus Reposing, and a few other statues that have survived the wreck of time are formed of this marble.

The Greek White Marble is of a very bright, snow-white colour, close fine grained, very hard, and takes a beautiful polish. The quarries from which it was obtained are said

to have been in Phrygia, near the river Coralis; and Pliny says it was also found in Asia, in masses of small dimensions. It was also obtained from Mount Caputo, near Palermo, in Sicily, and from several islands in the Archipelago. Amongst the statues of this marble in the Napoleon Museum, the most remarkable are a Bacchus, Zenon the Philosopher, and a bust known by the name of *Faune à la tache*.

The *White Marble of Luni*, on the coast of Tuscany, is fine, close-grained, exceedingly pure, and takes a very high polish. It was employed in the most delicate work, and was preferred by the Greeks to the Parian and Pentelic marbles. It appears to be even finer than that of Carrara, and is moreover free from those dark veins which frequently occur in the latter. Most mineralogists are of opinion that the Apollo Belvedere is Luni marble.

The *Carrara Marble* is well known, since it is almost the only kind made use of by our modern sculptors. It was also used extensively by the ancients, as is proved by the great number of statues still extant in it. The quarries are situated between Specia and Lucca, and are said to have been opened in the time of Julius Cæsar. It is of a fine white colour, but often traversed by grey veins, so that it is difficult to procure middle-sized pieces without them. In the centre of the blocks of this marble very limpid rock crystals are sometimes found, which are called Carrara diamonds. It is also sometimes, like the Pentelic marble, traversed by veins of greenish talc.

Besides these, the ancients used a great many coloured marbles—black, green, red, spotted, and veined. The most beautiful specimens that we have seen are the red "*Egyptum*." This beautiful marble is of a deep blood-red colour, marked here and there with white veins, and, if closely examined, is found to be sprinkled all over with minute white dots, as if it were strewed with sand. But the most esteemed variety of the *rosso antico* is that of a very deep red without any veins, such as is seen in the two antique chairs and in the bust of an Indian Bacchus, in the Museum of Paris. It is not known where this marble was obtained from; the conjecture is that it was brought from Egypt, but even this is uncertain.

About a century ago six tables of a very singular kind of marble were dug up, so the Abbé Fortis was told, at Mandragone. "They consist," says Dr. Reece, "of *white flexible marble* of very fine grain. Being set on end they bend, oscillating backwards and forwards; when laid horizontally and raised at one end, they form a curve beginning towards the middle; if placed on a table, and a piece of wood laid under them, they make a salient curve, and touch the table at both ends."

As before remarked, the quarries from which the ancients derived their marbles are unknown, and if re-discovered they would not in all probability pay for working. Fortunately, almost every country is abundantly supplied with many varieties of this stone. Asia, Africa, and indeed every island of any importance, has its treasures of marble. Dana gives the following account of marbles in his "*Manual of Mineralogy*," with especial references to the American sources of this substance:—

"Statuary marble has been obtained in the United States, but not of a quality equal to the foreign. Fine building material is abundant along the western part of Vermont, and south through Massachusetts to western Connecticut and eastern New York. In Berkshire county, Massachusetts, marble is quarried annually to the value of 200,000 dollars. The principal quarries are at Sheffield, West Stockbridge, New Ashford, New Marlborough, Great Barrington, and Lanesborough. The columns of the Girard College are from Sheffield, where blocks fifty feet long are sometimes blasted out; the material of the City Hall, New York, came from West Stockbridge; that of the Capitol at Albany from Lanesborough. At Stoneham is a fine statuary marble quarry, but it is difficult to obtain large blocks. The variety from Great Barrington is a handsome clouded marble. Some of the West Stockbridge marble is flexible in thin pieces when first taken out. There are Vermont localities at Dorset, Rutland, Brandon, and Pittsford. Extensive quarries are opened at New York, at Sing Sing; also at Patterson, Putnam county, at Dover in Dutchess county, in Maine, at Thomastown. In Rhode Island, at Smithfield, a fine statuary marble is found; in Maryland, a few miles east of Hagerstown, twenty miles from Philadelphia, a fine clouded variety is found. A fine dun-coloured marble is found at New Ashford and Sheffield, Massachusetts, and at Pittsford, Vermont.

"The granular limestone, when coarse, usually crumbles easily, and is not a good material for building; but the finer varieties are not exceeded in durability by any other architectural rocks—not even by granite.

"The impurities are sometimes so abundant as to render it useless. For statuary it is essential that it should be uniform in tint, and without seams or fissures.

"The common minerals in this rock are tremolite, asbestos, scapolite, chondrodite, pyroxolite, apatite, besides sphene, spinel, graphite, idocrase, and mica.

"Verde-antique marble, or Verde-Antico, is a clouded green marble, consisting of a mixture of serpentine and limestone, found at Genoa and Tuscany, and is much valued for its beauty. A variety is called Polzinera di Genoa, and Vert d'Egypte.

"A marble of this kind is found also in America, at Milford, near New Haven, Connecticut, of fine quality; also in Essex county, New York, at Moria, near Port Henry, on Lake Champlain.

"The Cipolin marbles of Italy are white, or nearly so, with shadings or zones of green talc.

"The Bardiglio is a gray variety, found at Corsica, also at Carrara.

"Compact limestone usually breaks out into thick slabs, and is a convenient and durable stone for building. It is not possessed of much beauty in the rough state. When polished it constitutes a variety of marbles, according to colour. The shades are very numerous, from white, cream, and yellow shades, through grey, dove-coloured, slate, blue, or brown, to black.

"The Nero-Antico marble is an ancient deep black marble; the Paragone is a modern one, of a fine black

colour, from Bergamo; and Pano di Morte is another black marble, with a few white fossil shells.

"The Rosso-Antico is a deep blood-red, sprinkled with minute white dots.

"The Giallo-Antico, or yellow antique marble, is deep yellow, with black or yellow rings.

"A beautiful marble from Sienna, called Brocatello di Siena, has a yellow colour, with large irregular spots, and veins of bluish red or purplish.

"The Mandelato of the Italians is a light red marble, with yellowish white spots. It is found at Luggezana.

"At Verona there is a red marble, inclining to yellow, and another with large white spots in a reddish or greenish paste.

"The Bristol marble of England is a black marble, containing a few white shells, and the Kilkenny is another similar. There is also a black marble found in America, at Shoreham, New York, and in other places in that State near Lake Champlain. There are several quarries at Isle la Motte.

"The Porto is a Genoese marble, very highly esteemed. It is deep black, with elegant veinings of yellow. The most beautiful comes from Porto-Venese, and under Louis XIV. a great deal of it was worked up for decorations at Versailles.

"The Bird's-eye marble of western New York is a compact limestone, with crystalline points scattered through it.

"Ruin marble is a yellowish marble, with brownish shadings or lines arranged so as to represent castles, towers, or cities in ruins. These markings proceed from infiltrated iron. It is an indurated calcareous marl.

"Oolitic marble has usually a grayish tint, and is speckled with rounded dots looking like the roe of fish.

"Shell marble contains scattered fossils, and is of different colours, as the Petworth and Bethersden marbles. It is abundant in the United States. Crenoidean or Encrinital marble differs only in the fossils being mostly encrinites, resembling thin discs. Large quantities are found in Onondago and Madison counties, New York, and the polished slabs are much used.

"Madreporic marble consists largely of corals, and the surface consists of delicate stars. It is called by the Italians Pietra Stellaria. It is also common in some of the States of the Ohio.

"Fire marble, or Lumachelle, is a dark brown shell marble, having brilliant fire or chatoyant reflections from within.

"Breccian marbles and Pudding-stone marbles are the polished calcareous breccia or pudding-stone.

"Stalagmites and stalactites are frequently polished, and the variety of shades is often highly beautiful. The Gibraltar stone, so well known, is of this kind. It comes from a cavern in the Gibraltar rock, and was deposited from dripping water. It is made into inkstands, letter-holders, and various small articles.

"Wood is often petrified by carbonate of lime, and occasionally whole trunks are changed into stone. The specimens show well the grain of the wood, and some are very handsome when polished."

We have at the present moment an admirable opportunity of studying the great variety of marbles which are produced in this and other countries in the Great International Exhibition. Many specimens are well worth a careful examination.

(To be continued.)

COLONIAL TIMBER FOR BUILDING AND ORNAMENTAL PURPOSES.

No. II.

IN a previous article we mentioned the various kinds of timber imported from our colonies for the use of the builder. There are other timbers grown in our colonies well adapted for all building and constructive purposes; but the great cost of felling the trees in their native forests, of transit, and of freight from distant ports, has hitherto excluded them from general use. We have still some excellent native timber which is available for the architect and builder, but, unfortunately, not in sufficient quantity; and it is desirable that we should know where timber of the same kind and quality can be procured in case of need. Among the timbers upon which we once prided ourselves, we may mention the chestnut-tree (*Fagus castanea*), a timber more durable even than the oak. This tree is understood to be a native of Asia. Tradition says that it was brought from Asia Minor by the Emperor Tiberius, and that it soon spread over all the warmer parts of Europe. The *Castagno de centi cavalli*—the chestnut of the hundred horses, upon Mount Etna—is the largest tree in Europe probably, if it still exists. This tree is described as being more than two hundred feet in circumference, and this measure does not mean the area its shadow would cast under a vertical light. Brydone, a traveller, who visited it about eighty years ago, allows its great age, but was rather disappointed with its appearance. It looked to him as not one tree, but a bunch of five large trees growing together. The guides to whom he expressed his disappointment assured him that all these were once united in one stem; that their grandfathers once remembered this, when it was looked upon as the glory of the forest, and that for many years past it had been reduced to the venerable ruin the traveller then beheld. Brydone, at the time he wrote, says: "There is an appearance that these five trees were really once united in one. The opening in the middle is, at present, prodigious; and it does indeed require faith to believe that so vast a space was once occupied by solid timber. But there is no appearance of bark on the inside of any of the stumps, nor on the sides that are opposite to each other. Mr. Glover and I measured it separately, and brought it exactly to the same size—viz., two hundred and four feet round." Great Britain cannot compete with Sicily in chestnut-trees; yet even here they thrive well, and also in Ireland. As far north as Castle Leod, in Ross-shire, there is a chestnut-tree which measures at least fifteen feet in circumference. In Kensington Gardens, at the present day, may be seen chestnut-trees

which rise far above the surrounding elms and other trees. These trees are, however, in a state of decay, arising, perhaps, from the nature of the soil. Chestnut-trees of immense size and of great age are recorded in English arboriculture, though none come near in age and dimensions to that of the Etna tree of "The hundred horses." One at Itchin Priory, in Hertfordshire, had, in 1789, a circumference of more than forty-two feet at five feet from the ground; and though the internal part was decayed and hollowed by time, the external part and the leaves were vigorous. Grose found one of four chestnuts in Great Cranford Park, Dorset, thirty-seven feet in circumference; and though shattered and decayed, it still bore good crops of fruit. In Gloucestershire there was a chestnut, in the hollow of which was "a pretty wainscoted room, enlightened with windows and furnished with seats;" and the great chestnut at Tortworth, in the same county, had dimensions and a reputed age belonging to no other English tree. In the year 1150 it was styled the "great old chestnut-tree." In 1720 it measured fifty-one feet at six feet from the ground; but Lysons, by a later measurement, 1791, made it only forty-five feet three inches. It bore fruit abundantly in 1788; and tradition carries it back to the days of the Saxon Egbert. The roof of Westminster Hall, one of the largest of ancient constructions anywhere to be met with, is built of chestnut, and does not appear to be in the least decayed. The roofs of many a manorial hall in England were formed of chestnut. Oak may give way in the structure of a building, but chestnut appears to have endurance without end, as it has no sapwood, and is not liable to be attacked by the worm. In old buildings it has frequently been mistaken for oak, but the pores in the alburnum of the latter are generally much larger, more numerous, and very distinguishable, while those of the chestnut are irregular, and scarcely distinguishable by the naked eye: there is also an absence of the transverse septa which distinguish the oak. The cohesive force of the chestnut varies from 9670 to 12,000 lbs. per square inch when dry. When green, it weighs 68 lbs. 9 ozs. per cubic foot; when dry, 41 lbs. 2 ozs. The chestnut, of course, will not be confounded with the horse-chestnut (*Æsculus hippocastanum*)—a soft wood, and not applicable to any purposes where strength is required. In the open air it has little durability. It has been used for water-pipes, when it can constantly be covered with earth. The wood, when newly cut, weighs 60 lbs. 4 ozs. the cubic foot, and when dry, 37 lbs. 7 ozs.

The chestnut, as we have said, is a native of Asia, but is found in North America, from New York to Carolina. The chestnut of America (*Castanea vesca*) weighs 25 lbs. 4 ozs. per cubic foot, with a specific gravity of .404. Portuguese chestnut of the same kind is denser, weighing 40 lbs. 13 ozs. per cubic foot, with a specific gravity of .653. This is considered a good wood when not too old. Nevertheless, it is possible to import from New Zealand a *Fagus* of the specific gravity of .531. Upper Canada produces the *Fagus ferruginea*, rather a beech than a chestnut, but a wood of great density, and one which is much used for the purposes of dry carpentry.

We are restricted to colonial woods; and there are colonial woods which, if not fitted for building purposes, have their value: for example, the black birch of America has been imported into this country. It is compact and rather handsome, but it soon decays. Birch makes very good charcoal. The alder (*Alnus glutinosa*) is not so handsome a tree as the birch, and the timber is not applicable to so many useful purposes. The alder is a native of almost every part of Europe. Of this wood, however, we have such short supplies from abroad, that it hardly deserves notice. We have many esteemed woods for building and ornamental purposes, but it would be tedious to mention them all. There is one wood, however, which must be familiar to the children of the present generation, though not so much so to those of the past—mahogany. Walnut for the wardrobe, the bedstead, the buffet, in former times was the choice wood. Mahogany came, and put it out of fashion. It had colour in its favour, and durability also; and the mahogany table at one time was held in due veneration in the household, and youngsters approached it as something sacred. To the present day mahogany maintains its price, and for the purposes of the cabinet-maker and wood-carver must always hold a first place, being close in the grain and susceptible of great polish. There are several varieties of the tree, some trees being rather soft, others knotty, others brittle; but the general characteristic of all mahogany is endurance and closeness of grain.

There are three species of mahogany:—Common mahogany (*Swietenia mahogani*), *Swietenia febrifuga*, and *Swietenia chloroxylon*. The first is a native of the West India Islands and the central parts of America, and the second and third are natives of the East Indies. They all grow to trees of considerable magnitude, the first and second being among the largest trees known. They are all excellent timber. It was formerly abundant in the low lands of Jamaica, but is only found there now on high hills, and places difficult of access. It succeeds, Gwilt informs us, on most soils, though it varies in quality according to their natures. In rocky situations, though it does not attain so great a size, it is harder, weightier, of a closer grain, and more beautifully variegated than in low rich lands, wherein it is produced more porous, of paler colour, and of a more open grain. It grows straight and lofty, and when full reaches a diameter of five feet. The flowers are of a red or saffron colour, and the fruit about the size of a turkey's egg. Indeed, but for its expense, it might supply, for beams and joists, the place of pine. For window-frames mahogany is admirably adapted; so also for door-posts and all uprights. The great expense of the wood confines its use in building to doors, hand-rails of stairs, &c. It has been used for ship-building purposes. Indeed, Sir Walter Raleigh was the first to apply it to this use in repairing his vessels in the West Indies, but it was many years afterwards before mahogany was known in England. Sir Walter Raleigh's ships were repaired at Trinidad, in 1597. The first logs were brought to England about the beginning of the last century. A few planks were sent to Dr. Gibbons, of London, by a

brother who was a West-India captain. Says the authority from which we have already made contribution, the "Library of Entertaining Knowledge," the Doctor was erecting a house in King-street, Covent-garden, and gave the planks to the workmen, who rejected them as being too hard. The Doctor's cabinet-maker, named Wollaston, was employed to make a candle-box of it, and as he was sawing up the plank he also complained of the hardness of the timber. But when the candle-box was finished, it outshone in beauty all the Doctor's other furniture, and became an object of curiosity and exhibition. The wood was then taken into favour. Dr. Gibbons had had a bureau made of it, and the Duchess of Buckingham another; and the despised mahogany now became a prominent article of luxury, and at the same time raised the fortunes of the cabinet-maker by whom it had at first been so little regarded. The variety called Spanish mahogany, and imported from Cuba, Jamaica, Hispaniola, and other West-India islands, comes in logs seldom more than twenty-six inches square, and about ten or twelve feet in length, and is harder and closer grained than that from the Bay of Honduras, from which it may be distinguished, before it is oiled, by being of a lighter colour, and as if its pores were filled with chalky matter. The Honduras mahogany has latterly been imported in logs of very large dimensions: logs have been imported fifteen feet long. The best timber grows on mountain-tops, and so far away from the port of transit, that the expense of carriage is the reason why the best mahogany does not reach our manufacturers. The best sort is that which is freest from grey specks, and of a fine golden colour. It is held firmly with glue, perhaps better than any other wood. A cubic foot of the best Jamaica mahogany weighs about fifty-four pounds; of Honduras, about thirty-eight pounds.

To give an idea of the value of mahogany, it may be stated that not many years ago Messrs. Broadwood, the well-known pianoforte manufacturers, gave the immense sum of 3000*l.* for three logs of mahogany. These logs, the produce of a single tree, were each about 15 feet long and 38 inches square; they were cut into veneers of eight to an inch. The wood was particularly beautiful, capable of receiving the highest polish, and when polished, reflecting the light in the most varied manner, like the surface of a crystal, and from the wavy form of the pores offering a different figure in whatever direction it was viewed.

Dealers in mahogany generally introduce an auger before buying a log, but notwithstanding they are seldom able to decide with much precision as to the quality of the wood, so that there is a good deal of lottery in the trade. The logs for which Messrs. Broadwood gave such a high price were brought to this country with a full knowledge of their superior worth. Honduras, Cuba, and Hayti are the principal sources of supply, the timber brought from the first being the cheapest and by far the most abundant.

When mahogany was first introduced as a cabinet timber, it seems to have been in the dark-coloured, hard, and straight-grained trees, which are now used for chairs and other articles in which the solid timber is preferred, and

on that account it was not much used in combination with other woods. When, however, its great value was known, the ease with which it can be cut, the improvement which varnish gives to its colours, the firmness with which it holds in glue, and the improvement which, when properly taken care of, it gains by age, it was found that mahogany was much too valuable a timber for being used solid; and it began to be employed as the staple timber for veneering. Other foreign woods, some of them lighter and others darker, were employed for borders and ornaments; but mahogany was used for the body of the work; and when it came to be so used, a great revolution was effected in the art of cabinet-making. On the first introduction of mahogany, the same process was resorted to that had before been practised with the walnut and other woods, and effect was sought to be produced by quartering panels, forming them of *gyrony*—a term of heraldry in which a shield is formed in sectors from the centre—with the grain in opposite directions, and other fantastic and unnatural arrangements; but in course of time a better taste was introduced, and the object was to have the whole surface of the same appearance as if the work had been made solid out of the rich timber. This was one step towards the attainment of a purer style, but the continuity of the surface was still interrupted by ill-assorted additions. The breadth of the mahogany, which would in itself have been beautiful, was broken by bands and strings of other wood, without much regard to the harmony of the colours; and thus that which with the veneer alone would have been chaste and classical, was reduced to a piece of patchwork. The veneering, whether done in mahogany or any other wood, was at first very expensive. The veneers were cut by the hand, and thus the piece cut off was of unequal thickness in the different parts; the wood was mangled by the operation of cutting, and the finest pieces, which, as has been said, are cross-grained or have their fibres across their thickness, were always in danger of being broken. It had been found that veneers laid upon good bodies of timber, whether of the more coarse mahogonies or of any other kind, were better in point of beauty and of standing without warping than solid timber; but veneer-cutting by hand was not only laborious, but wasteful and expensive. When the harder and more unmanageable species of fancy woods came to be used, the difficulty and expense were further increased; and though more beauty and variety were imparted to cabinet furniture, they were imparted at a corresponding increase of price. It is to the late Mr. Brunel that we were first indebted for the full advantage of the beautiful art of veneering. His process has been since greatly improved upon in France and Germany, where logs of fancy timber are pared down, if needful, as thin as a wafer. In treating of fancy woods, a few words may be devoted to this invention, as many of those from our colonies can only be used for cabinet-work. Brunel's machinery consisted of circular saws driven by mechanical power, and they so diminished the price of veneers, that the saving was immense. Independently of their superior beauty over our native woods, the foreign woods have the advantage of durability, both in their struc-

ture and in their colours. There are few of the indigenous woods of Britain into which the worm does not eat, and there are none of them in which the colours have not a tendency to come to the same shade, when long used, unless they are protected by varnish; while, on the other hand, the fancy woods from the tropical climates are generally, if not universally, proof against the worm in England, and they are not apt to lose their colours. Thus the introduction of machinery for the purpose of cutting veneers has been a material saving both in the cost and the wear of furniture, while it has enabled the workman to extend to a surface of thousands of feet any fine piece of timber he may meet with, and which before the invention of that machinery he could not have extended to as many hundreds.

The value to which a single log of fine timber is turned, by means of the improved sawing machinery, is really incredible to those who have not witnessed the operation. Thus, when the cabinet-maker has occasion for veneers, he has only to purchase a log of the wood which suits his purpose, send it to the saw-mill, and he has it cut up to the thickness that he wishes in a very short time and at a trifling expense.

Brunel's saws were on the circular principle; they were driven by steam. The teeth of the saw were rather large than otherwise, in order that the saw might not be clogged with sawdust, and thus tear the finest veneers; and it revolved with considerable velocity. The log of timber which was to be cut into veneers was fastened upon a frame, with the piece in the direction in which it was to be cut, in a vertical position. The frame which carried forward the log was moved at a rate which might be varied according to the quality of the timber to be cut. It had a rack on the under side, into which pinions worked. For coarse work the motion was rapid; for fine veneers, slower. The average rate of cutting was one foot in four seconds. At the mill of the Messrs. Watsons', of Battersea, there was a circular saw of eighteen feet diameter, which made thirty revolutions in a minute, and which in eighty seconds would cut a veneer four feet six inches long by thirty-three inches wide. A smaller saw, at which inferior timber was cut, had a quicker revolution, called a tumbling motion, where a piece of mahogany was veneered into a length of six feet six inches long by twelve inches wide in twenty-five seconds. The modern veneer saw more resembles a knife, which slices the log into veneers. The veneer varies from a twenty-fourth to a thirtieth of an inch in thickness, so that, if the saw-draft be one twenty-fourth of an inch wide, half the timber is cut into sawdust. It is hence of great importance to have the saw extremely thin. The body of the modern veneer saw consists of a lenticular piece of cast iron, having the meniscus form—that is, hollow on the one side, and round on the other. Without the aid of diagrams it would not be easy to describe its mode of action, and yet the machinery is extremely simple. The saws are made from five to twenty feet in diameter, according to the breadth of the logs they have to cut; and from twelve to eighteen slices are made in each inch of thickness.

Veneering in fancy woods has been compared to gilding and plating, but the process does not gain by the comparison, as the covering of one wood with another is a much nearer approach to solidity than the covering one metal with another. When the cabinet article is kept in such a state as that the glue is not dissolved, the covering of beautiful wood does not wear out; and thus, with a vast saving in the most costly material, there is the same durability, as if nothing but that material had been used for the whole. There is another advantage in the use of fancy woods on the surface; the body of the article upon which the fancy wood is laid can be much better put together than if it had formed the external part of the article. Where that is the case, dovetails or mortices cannot be wedged without an external seam; but in veneering, the body of the article can be put together with every degree of care and strength, and the veneer will hide the whole. We shall have occasion to mention various kinds of colonial woods adapted for veneers and cabinet articles. In the International Exhibition there are at present woods representing the forests of almost all of our colonies and dependencies, the bare enumeration of which, and the uses to which they may be put, would more than fill our columns.

Our fathers were contented with very humble furniture, well-made, it is true, but not often elegant. A taste for comfort and elegance universally diffused throughout society, not only calls into action a great deal of mechanical ingenuity, and employs considerable capital; but it gives even to the humblest a sort of self respect, inferior, indeed, to purer motives, but still tending to produce something of independence, and a desire to maintain the possession of those comforts and trifling distinctions by honest industry. The general adoption of articles of luxury, such as well-made furniture, by the bulk of the people, has a natural tendency to make the wealthy desirous of procuring articles not so accessible to the many; and in this way there is a constant demand, not only for new patterns in furniture, but of new materials to construct such furniture. Our commerce with all the known world has enabled the dealers in wood constantly to introduce new sorts; and our own colonies are capable of supplying us with varieties not only beautiful in colour and durable in fibre, but which mechanical skill and contrivance are capable of shaping into a variety of objects useful in themselves, pleasing to the eye, and calculated to find vast employment to the artisan and the designer.

The Royal Society of Northern Antiquaries of Copenhagen have just issued a volume of their *Mémoires*—that series of their *Transactions* which, written in French or English, is so much more accessible to non-Danish readers than their *Annaler*. The new volume embraces the years from 1850 to 1861, and contains two articles written in English, of special interest to us; the first, an article on Scottish and Irish local names occurring in the Icelandic Sagas, by Professor Munch, of Christiania; and Remarks by Grimur Thomsen, on Dasent's "Northmen in Iceland"—both translated into English by George Stephens. The volume contains also the *Treatise of the Ancient Giant-houses, or Druid-altars (Cromlechs)*, by the King of Denmark.

GREEK REMAINS IN FRANCE.—A discovery is said to have just been made at Marseilles, of the ruins of a Greek circus.

OUR SOLDIERS' HOMES.

No. II.

WILLINGLY, yet sorrowfully, do we return to a question in which is involved the comfort and health of a large class of British subjects. Last month we showed that our army at home has been subject to a frightful mortality of 17·5 per 1000 per annum, against 9·2 deaths per 1000 among the civil population. We stated facts which proved that, until very lately, we have had barrack accommodation for two-thirds only of our army on home service, and also showed that the fact of the remaining third part being distributed in barracks, already unhealthy (owing to being badly planned, unventilated, undrained, and not being supplied with pure water), was the turning point which predisposed the army to disease, filled the hospitals with sick, and raised the rate of mortality among soldiers to double that of males in civil life. Around town and many country barracks nuisances abound, the buildings are as badly arranged as they can be, they are densely crowded, non-commissioned officers and married men have generally no separate accommodation—in one case seven rooms contain 21 men, 21 women, and 33 children; there is little or no ventilation, while pure water and drainage would appear to have been considered as of no importance whatever; all this, and a good deal more, we pointed out in a former article, but there are yet many matters to which we must refer, in order to let the public know precisely how from seventy to eighty thousand men have been lodged.

But before considering some of these, we must revert for a moment to the plans of cavalry barracks in which the men's rooms are usually built over the stables, while in order to get as large a barrack-yard as possible the buildings are placed close to the boundary walls, or, as is the case at Regent's Park Barracks, in Albany-street, the buildings themselves form the boundary wall, and in consequence there can be no windows on the external side; boundary walls are, however, most common, and the space between them and the barrack buildings is usually appropriated for dung-pits, latrines, cook houses, ablution rooms, cleaning sheds, &c.; and when the paving is bad, this lane resembles nothing so much as one of the "filthiest and most neglected alleys in the filthiest parts of our towns." Horses are not so over-crowded as are the men, and the depth of the stable, from front to back, is considered to be more than is required by the men, so that over long ranges of stables there is, as in Hounslow Barracks, a narrow corridor running from end to end down the centre, while from it, on each side, open the men's rooms, of course lighted from one side only, and in the case of one range of room at least, the windows open on to the narrow lane of filth such as we have described above. To a person unused to them, and entering such rooms from the fresh air, the smell is unbearable.

The appropriation of casemates as part of regular barrack accommodation is another iniquitous arrangement. They are intended for occupation during a siege, and usually consist of a series of arches behind the cur-

tains or in the flanks; some are lofty, others are low, dark, and without means of renewing the air. The best, those at Dover Citadel, are thirteen feet high; the worst are, perhaps, those at Dover Castle, cut out of the chalk cliff, varying from 100 to 227 feet in length, and lighted at *one end only*; at Chatham, St. Mary's casemates are in two flats, they are long, narrow, dark, damp, over-crowded, and unhealthy cellars occupied by troops and by *invalids* returning from foreign service. Returns supplied in 1857 show that out of an average monthly strength of 749 there were for 22 months 6393 admissions to hospitals, and 142 deaths; the admissions to hospital per annum were four and a half times the strength, and the deaths were in the ratio of 103 per 1000 per annum, and of these 40 per cent. arose from consumption.

Of drainage we have before spoken as being defective, or altogether wanting, consequently we could not expect to find water-closets about barracks. The contrivance in use—and very primitive it is—consists of a long, deep trough, opening into a cesspit beneath a kind of ladder, and sometimes a single rail, extending from end to end over the trough, serves for seat; these cesspits are emptied at certain times, dependent on their capacity. For night use there is in each barrack-room a *tub*, regarding which, by-the-bye, a barrack regulation lately directed that it was to be of sufficient capacity to mix the limewash in with which the walls are whited!

Ablution accommodation in barracks is quite a modern innovation, for not many years ago the men had to betake themselves to the nearest pump. Most barracks have, however, since been provided with ablution-rooms, and they generally consist of sheds detached from the building in which the men's rooms are situated, and contain long narrow tables of wood or slate, with a number of metal basins. The commissioners came to the conclusion that there has been more improvement of late years in ablution accommodation than in any part of barrack construction; but the system has still serious defects. And the first of these is the distance of the lavatory from the men's rooms: the men have to wash partly dressed, and in that state must leave the close barrack-room and go through the open air to the washing-shed; here they probably have to wait their turn, and it may be in wet weather, for generally the number of basins and space provided is insufficient for the number of men. Few barracks at the time of inspection possessed means of bathing, but in some cases this necessity was found to be provided for by the limited means afforded by an iron barrack coal-box, or an old horse-trough. With regard to the washing of the soldiers' linen, this duty is generally performed by soldiers' wives; the wash-houses are usually very much too small, they are badly ventilated and lighted, and in many cases water has to be conveyed from a considerable distance, and when done with is thrown on the floor to escape down gratings. In most cases there is no means of drying the linen in wet weather, consequently it is secreted, and, against orders, taken to dry before the barrack-room fires; and at all times, the men are exposed to the danger of putting on damp linen. These, however, and most matters that

do not demand reconstruction of the barracks are being improved, and Wellington Barracks has now a wash-house and laundry capable of washing and drying the bedding required for 5000 men.

For a long time cook-houses were generally detached from the barrack building, sometimes near to them and sometimes far off. We have seen men leave their rooms, go across a wide parade-ground, wait their turn in the open air at the cook-house door, receive each his plate of victuals, and then either squat down on the ground and eat it in the open air, or retrace his steps across the parade ground, plate in hand, and uncovered, and up the stairs to the barrack-room, when the dinner must have been cold, and perhaps drenched with rain. After partaking of it, the same distance has to be traversed to return the plate. Until very lately, boiling was the only available means of cooking; and at the request of the Royal Commissioners, Messrs. Warrener and Guerrier, two experienced cooks, were appointed to examine and inquire into the whole subject of cooking in barracks; and for the purpose of comparison they extended the inquiry to a number of leading civil establishments in London, such as workhouses, prisons, schools, hospitals, &c. Messrs. Warrener and Guerrier prepared a valuable report, from which it appeared that the apparatus employed consumed a large amount of fuel, and that besides this defect, there was a want of sufficient knowledge of cooking on the part of barrack cooks. In some cases they were changed weekly, so that just as they began to "know the fire" they had to leave it.

Guard-rooms, lock-up rooms, and provost-cells all correspond, as regards overcrowding and no ventilation, with the barracks to which they are attached; and in some cases they are even worse. In nine guard-rooms at Chatham and Brompton, the cubic space per man varies from 142 feet to 282 feet! and this is for the accommodation of men who while on duty as sentries are exposed to all weathers, and if it rains have to lie down in their wet clothing. Nine lock-up rooms at Chatham vary from 132 to 287, and in one case 360 cubic feet of space each for the regulation number of inmates. Canteens, of which one is attached to almost every barrack, are generally leased to persons who pay to Government a fixed rent for the house, and, in addition, a sum called "head money," regulated by the number of men in barracks. This sum varies considerably; in some places, being as much as one guinea per month for every ten men in barracks; but whatever the amount, it is drawn from the pocket of the soldier. The sale of spirits is not, or has only lately been, permitted in canteens. The proprietor is not allowed to deal with civilians without the barrack walls, and the soldiers may go to his shop or not as they please. The canteen nearly always resembles, more or less, a public-house. Some are low, dark, and dirty, while others, and particularly some built by private individuals, are more pretentious, and are really light and cheerful. The entire question of canteens is one that we cannot here discuss; and besides, its consideration may, and we trust will some day, be rendered unnecessary, by a movement in favour

of the erection of *soldiers'* clubs, such as that lately opened at Chatham, at a cost of nearly 6000*l.*, for the use of the troops of the garrison, and which contains lecture, reading, concert, and smoking rooms, together with a library and refreshment room, the subscription being one penny per week. The advantages of an establishment of this kind, to which soldiers may resort and find equal or greater comfort than they do at the surrounding public-houses or in the ordinary canteen, are obvious, and regulations should be framed for every barrack to have in connexion with it a soldiers' club.

We have now reverted, more or less in detail as the importance of the subject immediately under consideration may have appeared to demand, to the more prominent defects of our soldiers' homes as they existed at the time of the general inspection by the Royal Commission, under whose direction considerable improvements have since been carried out in minor details; but as regards the deficient accommodation and consequent overcrowding, errors in plan, and unhealthy sites, these, as beyond the powers with which the Commission was invested, remain pretty much as we have described them, and an enormous outlay will be necessary to provide barracks at all suitable for the purposes to which they are devoted; for to expend money in the enlargement or alteration of existing buildings, will be but to perpetuate many of the errors to which we have directed attention. The existing buildings, or at any rate the larger number of them, are too bad to admit of being made healthy dwellings; and sooner or later, new barracks on better principles must be erected throughout the kingdom, and the sooner the better for the health and efficiency of our army.

It remains now to show how we may build healthy barracks. A few have been erected lately better in some respects than those we have described, but we are not aware that any barrack yet constructed has been designed without disregard of some of the most important points. But let us first briefly recapitulate some of the vital errors in old barracks. We have seen that the mortality in the British army at home is very excessive. This mortality, we have said, arises from impure air and impure water, and the careful reader will have seen that nearly all the evils of barrack construction lead to these, and indeed render a wholesome condition of water and air impossible. Soldiers sleep, said the Commissioners, in rooms where there is no systematic recognition of the relations of cubic space to ventilation, warming, and health. Hence great diversity of practice in the amount per man allotted in different barracks, in nearly all barrack-rooms the cubic space allowed being too small for health; and in many rooms the over-crowding is excessive, while additional overcrowding arises from placing more than even the regulation number in barracks. The sites of many barracks are exposed to marsh malaria, or are enclosed among the dwellings of the civil population, while the defects of planning appear to be piling too many floors of buildings one over the other, and the consequent agglomerating too large a number of men under one roof; constructing rooms back to back, or covering one side

of the building with corridors, so that windows on two sides are impossible, the use of internal corridors, dark and without ventilation, serving as channels for the passage of foul air between the various rooms opening into them; deficiency of accommodation for non-commissioned officers, leading to the obstruction of the light and air by "bunks;" boxing off staircases from rooms, with the same result; barrack-rooms in dark and damp basements; low ceilings, rooms over stables, and the appropriation of old buildings to barrack purposes to which they are not adapted. In the general or block-plan the buildings are constructed round enclosed courts, or with deep closed angles, leading to total or partial stagnation of the air and deprivation of sunlight, or in other cases they are too close to the boundary walls. Ventilation has been altogether neglected; warming has been effected insufficiently and with great waste of fuel; drinking water has been contaminated with sewage matter, in consequence of drainage being neglected; dung-pits have been allowed to accumulate under barrack-room windows; the cooking has been of one kind only. Bathing was for long unknown, and married soldiers with their wives and children sleep in the men's rooms.

No one can have the assurance to contend that these things should continue, but it is by no means very clear how any material improvement is to be effected; the old buildings, we repeat, do not admit of much improvement, and to build from two hundred to three hundred new barracks is a proposal not very likely to be seriously entertained for some time, however urgent the case may be; but the Commissioners have recommended that some of the worst barracks should be struck off the list. Among them, Fort Elizabeth at Cork, Linen Hall Barrack, Castle and Shamble Barracks, Galway, Portman Barrack, Knightsbridge Cavalry Barrack, Coventry and Clarence Barrack, Portsmouth, and some others; and, therefore, some new barracks must be erected, and it cannot be without a good result to make known, as widely as possible, how the defects of our present buildings are to be avoided. One thing, however, is very evident, that no matter how well known better principles of barrack construction may be, barracks will never be erected on those principles, and with sufficient regard to local circumstances, until there is a proper official recognition of the desirability of securing the services of an architect in their erection. The Commissioners, we believe, did recognise the principle, but their recommendation does not appear to have met with any great favour.

There is some disadvantages attending the selection of a site for a barrack, since its position must be determined primarily by military reasons; but it should always be kept in mind that a healthy country site is preferable to a town site; the climate should be not unhealthy, and the vicinity of marshes, stagnant water, and sites generally where malaria exists, should be avoided; a porous subsoil in preference to one of clay, or other retentive soil, should be selected; there should be a sufficient natural fall of ground to ensure drainage, and there should in all cases be an abundant supply of pure water in the immediate

neighbourhood; beyond these an area sufficiently large should be obtained in the first instance. The site being selected, the first matter that requires attention is drainage of the whole area within the barrack enclosure, to carry off the surface drainage, the depth of the drains, their distance apart and size must depend on the fall and the nature of the subsoil. There is no difficulty in draining perfectly an area of large extent, if only the work be done before the buildings are erected; if the buildings are to be situated on a slope that rises higher than the site, it will be necessary to cut a drain right across the ground of such depth as may be required to catch the water as it comes down from the higher ground; this "catch-water" drain may be deep or shallow, according to the nature of the soil; on stiff clay a drain near the surface will be sufficient, on a more porous soil it may be necessary to go much deeper to catch the water which has escaped downwards. With a well-planned system of tile drainage there can be no difficulty in keeping the entire surface of the ground solid and dry; the surface should fall from the walls of the building for a distance of eight or ten feet, where there should be a surface gutter. It has been recommended to pave the ground next the walls with stone flags, but good drainage is much preferable; for if there is any damp in the ground next the walls, paving serves only to prevent its evaporation. All the external walls below the ground should have a thoroughly ventilated, dry area in front of them, rising to a height of at least twelve inches above the ground level, which will afford space for air-gratings; and there should be a sufficient number of openings from the dry-areas to the space below the basement floor line, so as to allow of a constant circulation of air around the walls underground and under the basement floors. The dry-area itself will require a paved bottom, with a fall to drains, to carry off a considerable amount of moisture that arises from condensation or otherwise. In addition to these precautions for the prevention of damp in the buildings, the whole of the basement should either be covered with a layer of concrete, or it should be thoroughly drained; both concrete and drainage should be employed on porous soils, but wherever one system only is to be used, drainage should be preferred. Besides this, there should be just below the level of the lower floor, bedded in, and of the full width of the wall (if an inch wider on each side so much the better), two or three courses of slate set in hydraulic cement, or a course of glazed tiles, or a layer of asphalt or lead, and another course of materials impervious to damp should be laid in the walls just above the ground level. If this be done properly, there is very little fear of damp rising in any building, even if it be built on marsh land. In three-fourths of London suburban houses on clayey soil builders profess to build dry-areas, and adopt other means of "keeping down damp;" but the houses when finished are damp, and the walls reek with moisture, because the dry-area is so constructed as to be simply a reservoir for water from the surface of the ground, whence, equally in wet or dry weather, it is always soaking into the walls.

In some cases, cost of site would be an objection to such

an arrangement; but there is no doubt that a building consisting of a ground story and one story over, may be kept in a much more healthy state than one consisting of a basement and several stories over; at any rate, where it is intended for the accommodation of a large number of inmates. No arrangement could be more healthy than one consisting of a single line of buildings pointing north and south, so that in the course of the day the sun will shine on both sides; when the number of men to be accommodated would extend the line to an inconvenient length, it might be divided into two blocks opposite each other, with the parade-ground between them; and in a still larger barracks, two other blocks may be added to the ends to form a square; but on no account should the buildings touch at the angles, they should be left at a sufficient distance apart to ensure a constant circulation of air; it is the neglect of this principle in so large a number of barracks that made them so unhealthy as dwellings.

Stables, kitchens, latrines, or cleaning sheds should not be placed under the same roof as are the men's rooms; they should be in detached buildings, accessible under covered ways, and if sufficient space be left between the main buildings and the boundary walls, it will, if the walls be not too high, be perhaps the best position for them. The arrangement for barrack-rooms suggested by the Commissioners is a very good one; each range of barrack-rooms should consist of separate houses, with a party-wall between them, carried up through the roof; each house should be divided up the middle by a wide, roomy staircase, extending from the ground to the top, with a free ventilation through the roof; it should extend with the landings from the front to the back of the house, with windows on opposite sides; there should be two barrack-rooms on each floor, one opening out of the staircase on the right hand, the other out of the left hand side of the staircases, each room occupying the entire width between the two side walls; should have windows on opposite sides carried up to within a few inches of the ceiling, and arranged so that both upper and lower sashes will open; there should be no more than two rows of beds, with their heads to the side walls, leaving a passage down the centre of the room, which should be 12 feet in height, 20 feet wide, with an allowance of 5 feet for every bed in the length of the room. This will give 600 cubic feet of space for each bed attached to each barrack-room. But effectually separated from it as regards ventilation; there must be a sergeant's room and a night-closet. The new cavalry barracks at York, and the new Chelsea barracks have been constructed on these principles. In the former case, the new building is intended for 100 non-commissioned officers and men, and is two stories high with a central staircase, a sergeant's room right and left on each flat, and beyond each sergeant's room a barrack-room 60 feet long, by 20 feet wide, for 24 men; each room has a ventilating shaft at each end, inlets for fresh air between the windows, and a ventilating fire-grate; at the end of each room, opposite the door, is placed an ablution-room with fixed basins, and a night-closet. This building forms a separate block, but in New Chelsea Barracks a large establishment is being constructed

in separate houses in a single line, and the most convenient situation for the lavatory for such a construction is next the staircase.

Imperfectly as, unassisted by diagrams, we may have been able to convey to the non-professional reader an idea of the principles laid down, we have very little, if any, doubt that they contain the germ of healthy barrack construction, there are yet many points to be considered with reference to water supply, drainage, ventilation, &c.; these we must defer to a future occasion, but we are anxious to do justice to the efforts of the Commission, to whom we are largely indebted, not only for the data they have brought together, but for the endeavours they have made to effect an improvement in the condition of those buildings. It appears from an abstract in their general report, that the following sanitary improvements have been carried out under the direction of the Commission:—

Nature of improvements.	No. of barracks in which each improvement has been carried out.
Ventilation by shafts and inlets	74
Improved fire-grates, for ventilating and warming	28
Drainage, including abolition of cesspools	15
Improvements in latrines and waterclosets	45
Improved urinals	19
Improved water supply	17
Increased window space and improvements in sashes	8
Baths	54
Improvements in ablution rooms	43
Improved means for washing and drying linen	26
Improvements in cooking apparatus	75
Other improvements in kitchens	45
Improvements in manure-heaps and ash-pits	26
Ventilation of stables under barrack-rooms	13
Gas introduced	9

In addition to these, it is stated that other improvements—such as drill sheds, stores, &c., not shown in the abstract, have also been carried out on one or two stations. The general result of these improvements—we quote again the General Report—is to purify the air in and around barrack-rooms and hospital wards, to afford more variety in cooking food, additional means of cleanliness and bathing, diminished liability to disease, and protracted convalescence, and greater facilities for medical treatment of the sick. It is true, that the improvements as yet carried out constitute only a fractional part of those required to make the barracks and hospitals of the United Kingdom all that they ought to be as great public establishments; but a beginning has been made in applying practically to these establishments those sanitary works and measures which experience has shown to be very much required to preserve health and life in barracks and hospitals, no less than in all buildings where numbers of men are necessarily congregated together on a small area and within a confined space. It would be difficult as yet to determine the effect of these improved sanitary conditions in diminishing sickness and mortality, but we have not a doubt that when all barracks afford a proper extent of space for their inmates, and when the various sanitary improvements described are in full operation, their influence will be to effect a marked improvement in the health and efficiency of the army.

ON THE RECENTLY ERECTED BRIDGES OF NORTH WESTERN EUROPE.

BY G. R. S. BURNELL, ESQ.

It is very unfortunate for the interests of art that the construction of bridges, the class of public monuments which attract attention perhaps more than any others, should of late years have been entirely withdrawn from the direction of the men who specially occupy themselves with the study of the combination of art forms with the application of the science of building. Until a very recent period, indeed, there existed no distinction between the professions of architecture and of engineering, although possibly during the Roman period the men who erected the roads and bridges, the aqueducts and the ports, may have received a different education from the one given to those who erected the temples and palaces. During the middle ages, however, it is tolerably certain that there was no such distinction, and that the same master builders undertook the construction of buildings of every description. Even so recently as in the time of Louis XIV., Mansard built the Pont Royal of Paris; Perronet called himself "Architecte du Roi;" Telford even built a church, and at first mingled the pursuits of engineer and architect. In the middle of the last century, the organization of the French Engineers into the Corps Royal des Ponts et Chaussées, and the gradual development of the means of intercommunication in the other countries of Europe, seem to have rendered it desirable to establish a distinction between the pursuits of the architect, who only had to deal with statics, and those of the engineer, who had principally to deal with forces in motion, or with dynamics; and as the description of works in which the latter class of investigations had the greatest importance, was also involved in the construction of bridges, viaducts, &c., it naturally followed that they fell within the attributions of the members of the new subdivision of the architectural profession.

It so happened that the establishment of this classification corresponded nearly in the order of time with the discovery of the improvements in metallurgical science, and in the steam engine, which have enabled modern constructors to use iron as a building material in a manner hitherto unknown; so that, in fact, the introduction of this material corresponded with the abandonment of the study of æsthetics by bridge builders. The traditions of other times still lingered amongst the earlier civil engineers; and therefore we find that, in the works of Gauthey, De Cessart, De Prony, in France, and in those of Smeaton, Rennie, Nimmo, in England, attention was still paid to beauty of outline, even whilst their authors were striving to secure economy of materials, and logical forms of construction. In proportion as civil engineering assumed a greater importance as a social science, so, likewise, did it become a matter of necessity to secure in its works the greatest results at the least possible cost; and the abstract nature of the studies thus forced upon the attention of the engineer seems to have led them to treat with neglect everything connected with the decorative part of their

profession. This, at least, is certain, that engineering works have of late years followed a rapidly descending scale in the path of artistic design, until at last our modern bridges have attained a simplicity of ugliness so intense as to defy criticism. Surely this need not be! It does not occur so markedly in France as it does in England; because the French engineers in the course of their studies are compelled to follow the lessons of a professor of architecture, who maintains amongst them, to a greater or lesser extent, the love of art; and the modern French bridges often display a fine feeling for proportion, harmony, and grace of outline, combined with an air of solidity and massiveness appropriate to such works. The root of the evil, so far as we are concerned, lies, it is to be suspected, in the indifference our English public displays in its appreciation of works of art, and in the general ignorance of the art critics of the day of the principles of design which ought to be observed in the peculiar class of monuments referred to. The following remarks, therefore, will contain—1, a sketch of the recent history of engineering; 2, a short notice of some of the more important works lately executed in the form of bridges, aqueducts, and viaducts; and, 3, an investigation of their merits and defects from an artistic point of view only, our object being, in fact, to collect the materials for a practical Essay on the Architecture of Bridge Building, as it has recently been practised.

About the middle of the last century, the style of architecture adopted by bridge builders was based principally upon the practice of the great Mediæval Italian architects, and the designs of Michael Angelo, Palladio, Amminati, &c., were studied by such men as Mylne, Smeaton, and the unknown authors of such bridges as those of Gainsborough and Wisbeach. There was about them all rather an ambitious attempt at the introduction of ornamental architectural detail, and a species of horror on the part of their designers of large plain surfaces, for whenever such surfaces occurred, they were cut up into panels, rusticated, or made to carry shields, wreaths, or other decorations, in no wise connected with the construction of the design. Smeaton had the good taste to avoid the introduction of columns in front of his piers, in the manner practised by Mylne; and he usually avoided the errors (artistically speaking) of making his arches of equal span from end to end of the bridge, and of keeping his line of main cornice perfectly horizontal. The arches of Smeaton's bridges are nearly all portions of circles, and it was in those days a bold proposal for an English engineer to suggest, as Mylne did for the Blackfriars Bridge, the use of the semi-elliptical arch. In France, however, the engineers resorted to the elliptical arch without fear or hesitation, and the marvellous works of Hupeau, de Regemorte, Gabriel, Bayeux, de Voglie, Perronet, &c., served as illustrations of the advantages of that form, and as models of the mode of its application. In the commencement of their practice both Telford and that far greater man, John Rennie, seem to have hesitated in using the elliptical arch, and such "rule of thumb" men, as, for instance, the grossly over-estimated Brindley, were not able to appreciate either its beauty or

its use—perhaps because they were unable to calculate its conditions of stability. Dance and Ralph Dodd, in their various projects, followed timidly the traces of Perronet, but it was not until John Rennie attained his merited distinction that the English bridge-building began to imitate the boldness and the elegance of design observable amongst the analogous productions of our neighbours. To whatever circumstance it may be owing, it must at any rate be admitted that the construction of the bridges of Orleans, Melun, Nantes, Neuilly, Tours, Samur, &c., preceded the construction of the Waterloo, London, Staines, Limerick, Gloucester, &c., bridges, by more than half a century, and that our engineers were for a long period inferior to those of France in the boldness and the skill of their designs. As for the artistic merits of the English bridges of the latter end of the eighteenth century, there is little to be said. Smeaton's outlines had an air of severe beauty, which at times almost rose to sublimity. Brindley, Chapman, and Jessop never rose to mediocrity as artists; Telford's early bridges were very funny affairs; and even Rennie, in the commencement of his career, was but slightly superior to his contemporaries in the attainment of beauty of form. In all walks of art, in fact, the latter end of the eighteenth century was a dreary waste in our national history; it may not, then, be a matter of surprise that bridge-building should have followed the same fortunes as the other branches of art in England at this inauspicious period.

It was in the year 1777 that Abraham Derby erected the first cast-iron bridge at Coalbrook Dale over the Severn. It was certainly a bold experiment for a first trial, the span of the arch being 100 feet 6 inches, and the height from the ordinary low-water line to the underside of the ribs 55 feet; but it was far from being elegant in its design, nor was the metal very logically disposed in it. The Sunderland Bridge, begun by Tom Payne, and finished under the superintendence of Thomas Wilson, of Rotherham, in the year 1796, was the next structure of importance in which cast-iron was used; the springing line of the arch is placed at 60 feet above low-water line, the chord of the arc is not less than 236 feet, and its versed sine is 34 feet—dimensions, in fact, which have rarely been exceeded at the present day. It was, however, frightfully ugly, especially in the abutments, which are totally devoid of elegance or any attempt at design. The Buildwas Bridge, by Telford, over the Severn, finished in 1796, presented at least an appearance of study on the part of the engineer, and though great exception may be taken to the logical principles on which the design was made, the appearance of this bridge is far superior to that of contemporary works of the same description. No iron bridges were attempted on the Continent about this period, for the metallurgic arts of our neighbours were not sufficiently advanced to allow of their using cast-iron in the bold manner introduced here by Telford principally, whose aqueducts on the Ellesmere canal at once secured the position of the new material.

When France settled into order from the consequences of her fearful outburst of 1793, under the stern rule of

Napoleon, it was soon found that in order to secure the boasted unity of the "Great Nation" a complete system of roads was necessary. The Emperor, therefore, paid great attention to the organization of the Ministry of Public Works, and impressed great activity on the operations of the Engineers of the Ponts et Chaussées. Now the leading men of that branch of the public service, during the period of the first Empire, had been men educated in the school of the Perronets and the Hupeaus of the previous generation, and had imbibed the taste for the arts of the brighter periods of antiquity, which had been so strangely exemplified by David and his school, and by the Anacharsis Clootz or other parodists of the republicans of Greece and of Rome, in matters political. They were, however, men of great science, and were thus preserved from many of the errors into which the more mechanical copyists of antiquity in the other branches of art unquestionably fell. The consequence was that the Engineers of the Ponts et Chaussées during the Empire adopted a style of building which bore markedly the impress of the ruling genius of the nation, and which may be described as presenting a bold, massive simplicity, and a monumental grandeur, strikingly like the style of the works executed in the commencement of the Roman Empire. The bridges of Jéna, Sèvres, Rouen, Frouart, the Mont Cenis and the Simplon routes, may be cited as illustrations of the works of this period; and the names of such men as Gauthey, Rony, Lamandé, Sganzin, Lamblardie, Le Masson, Lecreux, Deschamps, Girard, &c., as representatives of the prevailing taste in engineering works. The Ponts of Jéna and of Sèvres are, in their respective styles, amongst the most beautiful works in existence, and the stone bridge of Rouen is equally beautiful; in fact, the segmental, semicircular, and elliptical stone arches are in these bridges handled with consummate skill. The Pont de la Concorde is a work of this period, which has been admired more than it deserves, because the heavy stunted columns on the face of the piers have evidently little to do with the main purposes of the bridge, and in themselves they are very ugly; but the arches are bold, their proportions well calculated, and there is an air of solid grandeur about the whole mass. As a rule, indeed, the French engineers of the beginning of this century were almost liable to the accusation of affecting an absence of ornament, and of trusting for effect to the mass of their compositions. Is this an error? Frankly, if it be so, we are mistaken in our own opinions on the subject of the taste to be displayed in bridge building; for we hold that the Pont de Jéna is (leaving out of account, for the present, the question of the horizontal road line) one of the finest bridges of Europe, notwithstanding the modern improvements in the practical arts of construction. After the peace of 1815, during the reign of the Bourbons and the early part of the reign of Louis Philippe, the same taste prevailed amongst the leaders of the Administration of the Ponts et Chaussées as during the days of the first Napoleon. Nor could it well be otherwise, because such men as Deschamps, Vicat, Navier, Minard, Emery, Bruyère,

Virla, Reibel, &c., had been educated in the midst of the representatives of the period immediately preceding their day, and the modes of thought engendered by the organization of the Empire were still prevalent, in the higher branches of the public administration at least. In the early periods of the "Restauration," the use of iron as a material for bridge building began to extend in France, and the bridges of the Jardin du Roi (since demolished, and replaced by a stone bridge), the Pont des Arts, and the Carrousel may be cited as illustrations of the style of treatment then adopted. Between 1820 and 1836, also, the erection of numerous chain and wire suspension bridges over the Seine, Garonne, Soane, and Rhone, under the directions of Navier, Seguin, Vicat, Leblanc, and others, modified to some extent the face of the art of bridge building, but, as we shall have occasion to see, only for a time. It may be advisable here to observe that the French engineers, and the engineers of the countries which followed the example of that nation, such as the Swiss, Spaniards, Russians, &c., adopted the system of iron wire suspension in preference to that of the solid bar chains so universally adopted in England, and that it is precisely to this fact that we may attribute the small durability of the French suspension bridges.

In the early years of the present century the art of bridge building in England passed through some curious phases, dependent principally upon the individual tastes of the more eminent engineers, which seem to have been singularly modified by the effects of practical experience. Thus Mr. Rennie, in his design for the Kelso Bridge, evidently was preludeing for the design of Waterloo Bridge; and in the Esk and Cree bridges he made the first attempts to carry out the principles of composition, subsequently applied with such marked success by his sons, in the Hyde Park and Staines bridges. In the Stoneleigh, Kelso, and Waterloo bridges, Mr. Rennie fell into the errors of employing either columns or niches in the solid parts of his piers and abutments, and of introducing elaborate cornices, which look strangely inconsistent with the massive simplicity of the general outline. At one period of his life, Rennie seems to have delighted in the perfectly horizontal line for the roadway of his bridges; for at Stoneleigh, Kelso, and Waterloo he adopted that principle; but in the Esk, the Cree, and the London bridges he adopted a slightly curved line both for his roadway and his cornice, and he seems at last to have recognised the existence of the optical law which causes every long horizontal line to appear to deflect in the middle of its length. Telford's works contain few signs of the development of taste thus observable in those of Rennie, for the Montford, Bewdley, Tongueland, and Gloucester bridges, erected at very different periods of Telford's career, are alike deficient in feeling or elegance of form, whilst they display an affectation of architectural treatment and a desire to introduce "jutting, frieze, buttress, coigne of vantage" of the Batty Langley style of Gothic, which are often positively ludicrous. The bridges on the Highland roads and the Highgate Archway may be exempted from this general condemnation; but even in them the ignorance of

Telford, in everything connected with optical effects, is painfully evident to an educated eye, and whatever may have been his merits as a contractor, he was very far from being entitled to rank as an artist. Telford, in fact, seems not to have possessed any knowledge of the laws of perspective or of light and shade; so that the effect of his works is very different from that of their geometrical elevations, and perhaps from what he himself intended; moreover, his early education as a mason seems to have impressed on his mind a strange love for mouldings, rustics, and other modes of cutting up his plain spaces. In the Glasgow Bridge, which, by the way, is far from being his worst work, illustrations of these defects may be observed; and it also displays Telford's preference for the segmental arch, over the more elegant elliptical one adopted by the French engineers, and by Rennie in his best works. Contemporaneously with these "giants of engineering," such men as Smirke erected the very elegant bridge over the Eden, near Carlisle; Harrison, the wonderful segmental arch of Chester; Nimmo, the beautiful bridge of Limerick; Walker, the Bow Bridge, &c.; and in their productions there was unquestionably to be discovered an attempt to introduce in this department of art a greater degree of elegance than has prevailed of late years amongst us. The use of cast iron had at this period been earnestly adopted in England, and such works as the Craig Ellachie and the Tewkesbury Bridges by Telford, the Southwark Bridge by Rennie, the Vauxhall Bridge by Walker, the Laira Bridge by Rendel, the Chepstow Bridge by Rastrick, furnish good illustrations of the different manners in which that material was employed. The suspension bridges of Dryburgh, Menai, Conway, &c., by Telford; the Tyne and Hammersmith, &c. bridges, by Captain Sir C. Brown; the Bourbon Bridge by Brunel, &c., were erected about the close of the first quarter of the century; and, notwithstanding the recent rapid growth of the profession of engineering, they still command the admiration of the qualified observer. The Menai Bridge, indeed, is even at the present day remarkable for the boldness and the hardihood of its proportions, and though its details are sadly deficient in everything like artistic feeling, Telford's Suspension Bridge produces a far more pleasing effect upon the eye than does the more recent and more ambitious structure of the Britannia Bridge. Sir C. Brown's work at Hammersmith is also a remarkable structure, and as an artistic production it may well compare with the Fribourg, or even with the more recent and more ornate Pesth Bridge, by Tierney Clark. Reference may here be made to a peculiar class of bridges—viz., the canal aqueducts, many of which were erected during the first quarter of the present century: such, for instance, as the Ceiriog and the Pont y Cystre Aqueducts, by Telford, and the Lune Aqueduct, by Rennie, for they were of great boldness, and the latter especially of great beauty—far superior, indeed, to the boasted Pont du Guétin, erected in France about this period.

In Germany and in Italy the style adopted at the period now under consideration was very similar to the one which prevailed in France, and therefore it hardly requires a

special notice. Wiebeking, it is true, constructed a series of wooden bridges of rather peculiar outlines, dependent upon the modes of framing he adopted, but masked with thin planks in a manner intended to imitate stone construction, but which simply produced miserable and impossible shams. In the provinces of Westphalia, and upon the affluents of the Rhine and of the Danube many substantial and elegant stone bridges were erected; and the bridges over the Dora Riparia, at Turin, and of Bufalora over the Mincio, merit more than a passing notice. In all these cases, however, the engineers seem to have adopted the principles of design which had regulated the practice of the best epochs of the French school—that is to say, of Hupeau, Perronet, Lamandé, &c.; they trusted, for the effect of their compositions, more to the mass and simplicity of outline than to the introduction of petty ornamental details, and to some extent they are liable to the reproach of making an ostentatious display of the mathematical principles of their construction. In the United States, also, the art of bridge building was cultivated to a great extent for roads and canals; but the nature of the materials at hand, the peculiar organization of society, the politico-economical conditions of the country, and the singular inelegance of taste, manners, and modes of thought of the inhabitants of the United States, all combined to render it difficult to attempt to communicate any artistic character to works supposed to be simply useful. The feverish restlessness of the “working bees” of America is, indeed, unfavourable to the cultivation of refined taste, for the latter can only co-exist with the leisure and reflection of an advanced state of society. The American bridges of the earlier portions of the nineteenth century, then, may be consulted by those who wish to study the modes of constructing cheaply huge timber structures—as, for instance, in the case of the bridge over the Delaware at Trenton, the colossus bridge near Philadelphia, the timber aqueduct at Georgetown, &c.; but the only lessons the art student would learn from them would be, in fact, “what to avoid.” All high art is the product of calm, earnest reflection by highly refined minds, and men of that disposition are sorely out of place in a country wherein the first struggles against nature are still being waged; they are neither listened to, or appreciated by, their more energetic and more practical contemporaries.

The preceding remarks have designedly been limited to the period antecedent to the introduction of the railway system, because a very marked change came over the face of the art of bridge building subsequently to 1830, connected with so many modifying circumstances in the contemporaneous condition of society as to require a special and elaborate organization. But in concluding the first part of this investigation, it may be important to call attention to one fact which has unquestionably had a great influence on the external character of bridge building, considered as a branch of monumental architecture—namely, that both in England and in America the profession of engineering is open to all the world; whilst on the Continent of Europe all the public works of that description are confined to the regularly educated branches

of the public administration. Neither of these systems can be considered perfectly satisfactory for the interests of art, because the system of liberty, whilst it certainly is favourable for the exhibition of originality, too often enables men to dispense with study and refinement; whilst, on the other hand, the system of State education, and of administrative centralization, leads to the suppression of individual character and the exhibition of pedantry. In fact, all the French bridges of the periods hitherto considered have an air of family likeness; the English ones are by no means so monotonous, but they are too often utterly devoid of taste: and it is to be observed that all the improvements in the mechanical execution of bridges have originated of late years either amongst ourselves or in America. The introduction of cast-iron as a material for bridge building, the invention of the suspension bridges, the introduction of the lattice, and of the Burr’s framed girders, could hardly have taken place in countries where organized bodies of Government engineers must avoid hazardous experiments, and must be able to shelter themselves from the chances of failure by adhering to the processes which had received the sanction of practical experience. It is curious, that precisely in the cases of the introduction of cast iron, and of the suspension principle, into France, some striking illustration of the results of the two systems may be observed; for Lamandé, in his Pont du Jardin du Roi (as then called), neglected to provide for the contraction and expansion of the metal; and though some temporary expedients were adopted to obviate the consequences of the error, the bridge itself was never sound, and it has lately been destroyed. Again, Navier himself, the first mathematician, and the soundest writer on physics France has yet produced, was able to write a work on the Philosophy of Suspension Bridges, which still guides the practice of European engineers; but he was not able to build a suspension bridge that could support even a trial load. Of course, there is no necessary connexion between the deficiencies, artistic or constructional, of the engineers of the respective countries; but the results referred to above occur with such frequency that we are justified in suspecting that the cause we have suggested may have produced them; and then, in the end, the system of liberty is more likely to be favourable to the true interests of art—as it certainly is to the moral interests of society—than the most intelligent system of centralization can possibly be. Starting, as the English engineers did, from the Brindleys, Chapmans, Jessops, &c., they rose in artistic merit to the school of the Rennies, Nimmo, Rendel, &c.; whilst the French engineers could barely maintain the reputation of their glorious school of the commencement of the eighteenth century. The one body had a vital principle at work to urge it forward; the other was condemned to immobility and routine. In both cases, however, the artistic character of bridges has suffered greatly from the removal of this class of structures from the attributions of architects, and their transfer to a body of men whose pursuits do not lead to the study of beauty, of form, or of colour; and, as we shall have occasion to observe hereafter, it is to be feared



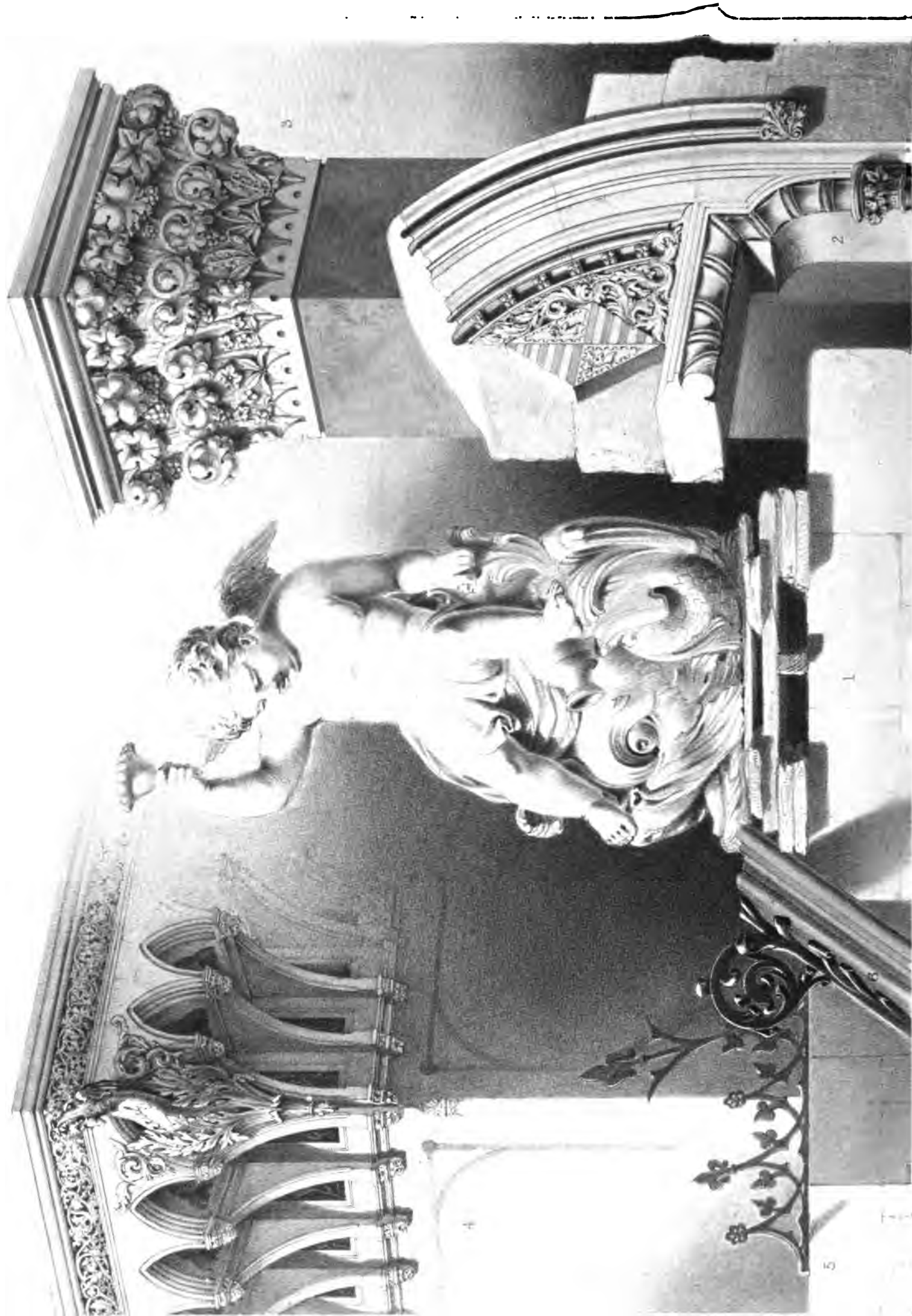
ROBERT DUDLEY, DEL ET LITH

A. H. DAINES, ARCHT

VINCENT BROOKS, IMP.

DRINKING FOUNTAIN IN THE VICTORIA PARK.
THE GIFT TO THE PUBLIC OF MISS BURDETT COULT.

CALCUTTA HOUSE, LONDON



ROBERT DUDLEY, DEL. ET LITH.

A. H. DARBISHIRE, ARCHITECT.

VINCENT BROOKS, IMP.

FOUNTAIN IN THE VICTORIA PARK.
PRESENTED TO THE PUBLIC BY MISS BURDETT COUTTS.

DETAILS.

- | | | |
|--|----------------------------|-----------------------------------|
| 1 ONE OF THE MARBLE FIGURES OVER BASINS | 3 CAP OF ONE OF MAIN PIERS | 5 IRON CRESTING AT SPRING OF HOOP |
| 2 ARCH OF DOORWAY TO INTERIOR OF CONDUIT | 4 CORNELIAN CORNICE | 6 CHOCOLATE AND HOOP RING |

FAIRBANK & BUNN, LONDON

that until engineers again become somewhat of architects, as Perronet was, the artistic capabilities of the new materials, and of the new descriptions of structures required to meet the wants of our modern civilization, will not be treated so as to secure for them their full effects.

The fact that Continental engineers work with the money of the State, and thus are, generally speaking, freed from the necessity of studying the economical results of their operations, enables them to pay more attention to the artistic effects of their designs than can be done in countries where public works are confided to private contractors, who must derive a profit from their investments, and are thus tempted to economize wherever it is possible so to do. This alone would suffice to establish a difference between the styles of engineering in the respective countries; but, in addition thereto, it may be observed, that local and physical circumstances have had considerable influence on the expression of English and French engineering especially. Thus the majority of the English rivers are tidal, and have beds composed of alluvial matters of great depth, whilst the French rivers are mostly without tides, torrential, and with rocky bottoms. In France, building stones of singular beauty are to be obtained everywhere, and at a moderate expense, so that the use of stone is universal; in England, stone is always dear, and masonry, from the fact of its being an art of luxury, is very costly. The consequence is, that there is a tendency on the part of our engineers to resort to the methods of construction which may attain the desired ends with the smallest expenditure of means, and to avoid the use precisely of those materials which are required to communicate a monumental character to their works. Whatever may be the precise amount of influence of these various causes, it is, however, certain that the general type of French and other continental engineering was bolder and more artistic than that of English or American engineering until the railway system was introduced. The changes which have come over the whole of this branch of the arts, since 1830, have been sufficiently important to require a special and detailed examination, reserved for another article.

NEW PULPIT IN WESTMINSTER ABBEY.—A very beautiful pulpit is being erected in Westminster Abbey. Its position is on the north of the nave. The pulpit, which is octagonal in shape, is composed of carved yellow Mansfield stone and coloured marble, and is a mixture of the early English and French styles. The body of the work is divided into compartments inlaid with diamond-shaped panels, containing circular ornaments inlaid with various coloured marbles. Six finely-carved figures, representing St. Peter, St. Paul, and the four Evangelists, are placed at the angles dividing the panels, the centre panel containing an exquisitely-cut medallion portrait of the Saviour in white marble, and crowned with thorns. The pulpit is supported by coloured marble pillars, and is approached by a flight of stone steps, with coloured marble and stone balustrades. The whole of the details of this elegant work are richly carved, and it forms a noble addition to the cathedral. The architect is Mr. G. G. Scott, and the sculptor Mr. Farmer.

TEST FOR POISONOUS PAPER-HANGINGS.—Common spirit of hartshorn or ammonia is a sure test for arsenic. On application, the beautiful but dangerous green turns to a blue. A small drop, on the back of a leaf, might be made to reveal the secret of its deadly composition; but the unnatural vividness of the green itself is almost sufficient.

DESCRIPTION OF THE ILLUSTRATIONS.

THE VICTORIA FOUNTAIN, VICTORIA PARK.

PLATES I. AND II.

WE have much pleasure in presenting to our readers this month a fine view of the most elegant drinking fountain in the metropolis, perhaps in the world. We have, in various parts of the country, very many chaste and beautiful fountains; they are however, generally small in size, economy, as well as taste and utility, being a matter of serious consideration to the designers. In the present instance, however, money seems to have been the last thing thought about, the liberality of the donor being so profuse that every part of the structure is finished in the most elaborate and costly manner. We shall preface our description of the fountain itself with a brief account of the locality in which it is situated, that we may see how appropriate the gift is that has been bestowed on it by a lady whose benevolence is universally known.

Victoria Park is situated at the east end of London, adjoining the densely populated districts of Bethnal-green and Mile-end. It covers an area of 275 acres, is laid out with great taste, well stocked with trees, shrubs, and flowers, and has lakes for boating and bathing, as well as an excellent gymnasium. There are also refreshment-booths, and, indeed, everything that can minister to the wants and pleasure of those who seek relaxation from the toils and cares of life in healthful exercise in the open air. On Sundays, and certain evenings of the week, there is an excellent band of music playing on a stand erected for their accommodation. As may be expected, the park is generally visited by great numbers of people every day, and we are credibly informed that there are seldom less than sixty thousand people there on Sunday afternoon listening to the music.

The east end of London is too often a *terra incognita*, not simply to visitors from the country, who are seldom induced to extend their travels in town beyond the Tower; but, comparatively speaking, few people in London itself dwelling to the west of Temple-bar, know anything about the immense districts lying east and north-east of the Royal Exchange, and which contain many hundreds of thousands of inhabitants. To the myriads who live by the docks and shipping, and who congregate about Ratcliffe-highway, Commercial-road, Whitechapel, Stepney, and Mile-end, must be added the immense population, Jewish, Christian, and heathen, which lives and trades in the neighbourhood of the Minories and Shoreditch, the Spitalfields weavers, and the vast nondescript population that surrounds Bethnal-green and Hackney-road. It is for their benefit that this new park has been formed, and to them Miss Coutts has given this beautiful fountain. Prior to its erection, the park had water in great abundance. There was

Water, water everywhere, but not a drop to drink.

And if we may judge from the manner in which it was surrounded when we visited it the other day, and the eager competition which there was for the cups, we should judge that there were many "thirsty souls" in the locality, and that no gift could have been more acceptable than an unlimited supply of pure water.

If we were disposed to criticise the work at all, the only fault that we should find with it is, that it is too fine to last. The stone carving is too minute to endure as it should for generations to come. It is, however, well executed, and reflects great credit on all the parties concerned in its production. The following are the dimensions and general description of the building:—

Its arrangement is octangular, and consists of a podium, or base, 40ft 9in. diameter, and 3ft. 6in. high; and of a superstructure 24ft. 6in. diameter, and 55ft. high.

The podium contains eight flights of steps 6ft. 4in. wide, leading to the superstructure. Its masonry consists of Portland and Kentish ragstone; Gaseby stone being employed for the steps and paving.

The superstructure is divisible into an exterior and an interior octagon. The former consists of eight piers of polished Peterhead granite, with carved capitals of Aubigny stone, from which spring moulded arches and groins. The height of the piers is 18ft. 6in.; that of the crown of the arches is 25ft. above the podium. The spandrels of the arches contain moulded panels with slabs of polished marble. Above these rises the principal cornice, composed of arches, brackets, and pendants, enriched with red and green marbles, and surmounted by a perforated parapet. The total height to the top of the parapet is 34ft. from the podium.

The interior octagon is 13ft. 4in. diameter, or 11ft. 2in. less than

the arcade by which it is surrounded. Its base is three steps, or 1ft. 6in. above the top of the podium. Four of its sides are occupied by the fountains; three are filled with marble panels and inserted tracery; and on the eighth is situated the entrance to a chamber which affords access to the water supply and roof. At each angle a polished shaft of Peterhead granite, 6in. diameter, rises to the height of the external piers, and is connected with them by moulded ribs which intersect the groined roof of the arcade.

Each fountain consists of a grey Aberdeen granite pedestal with bronze enrichments, containing a basin to receive the water, which is supplied by a Sicilian marble figure in a fluted niche above it. The head of the niche is canopied, carved, and filled with tracery. The drinking cups are of bronze, silver-plated on the inside, and on the outside bearing Burton's adage:—"Temperance is a bridle of gold." The panels of the alternate sides of the octagon are filled with slabs of Connemara green marble, separated by a band of Emperor's red marble, bearing the following inscription:—"The Victoria Fountain, given anno domini 1862, by Angela Georgina Burdett Coutts, for the love of God and country."

This inscription, and the inserted tracery above it, are filled with green mastic.

Foliage and armorial bearings occupy the upper portion of the doorway leading to the interior of the building. They are enclosed by a label, upon which is carved in letters of high relief the first verse of the twenty-fourth Psalm:—"The earth is the Lord's, and all that therein is."

The door is of oak, and contains panels of bronze grille. Both the exterior and interior octagons are covered by a timber roof, which springs 1ft. 9in. above the top of the perforated parapet, and rises to the height of 55ft. above the podium, or 58ft. 6in. above the ground-line. Clock-dials, and gablets filled with green glass, occupy its alternate sides.

The covering and the ornamental details connected with it are of lead. The cresting upon the angle ribs is of wrought-iron, and the vane is copper-gilt. The works have been executed under the direction of Mr. H. A. Darbishire.

VIEW OF NEW BUILDINGS, 107 & 108, CHEAPSIDE.

PLATES III. & IV.

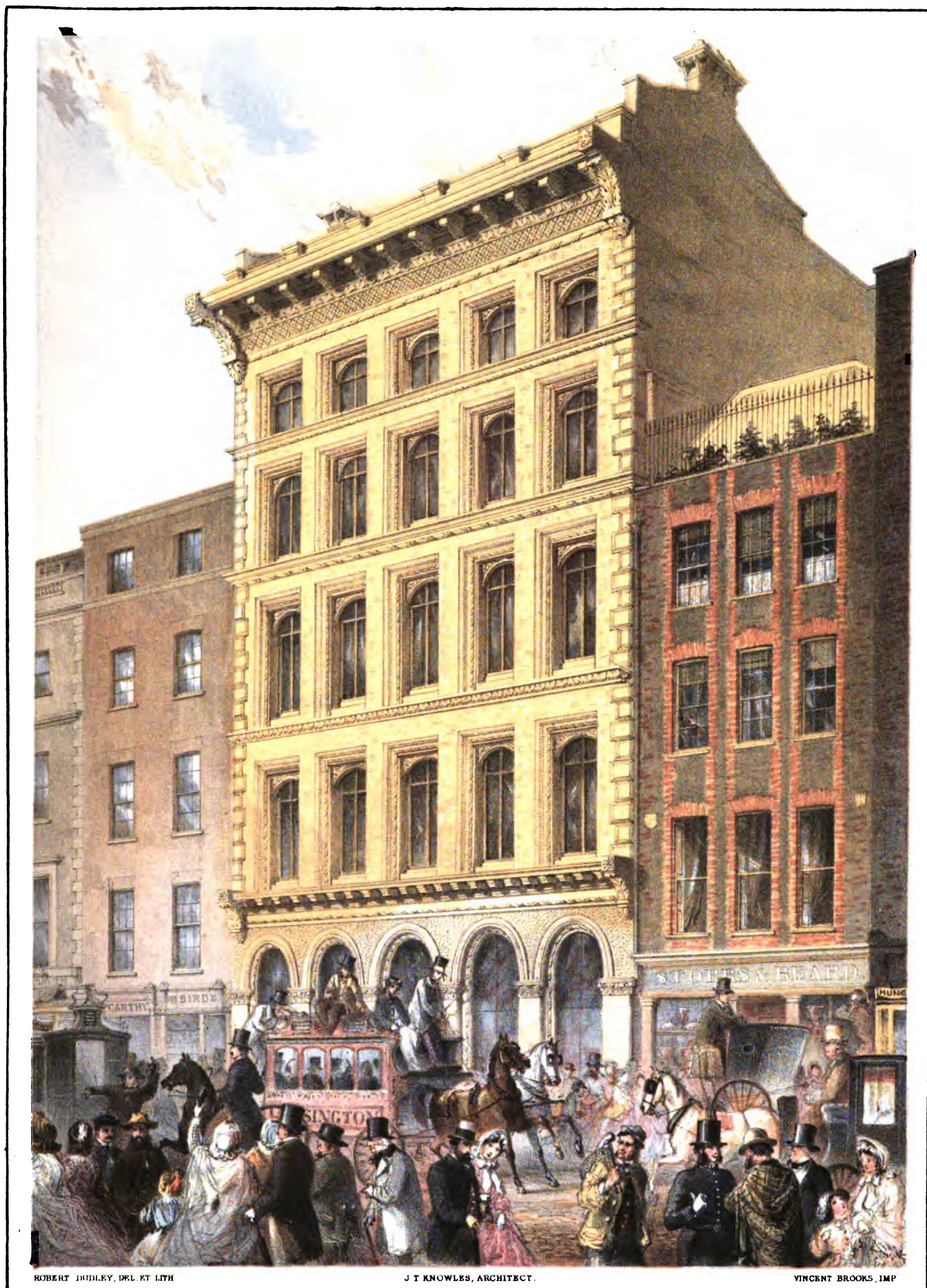
WE are unable to give the full particulars respecting the premises shown in Plates III. and IV., which we are in the habit of supplying to our readers in other cases, from the architect declining to supply us with his drawings, under the mistaken impression, if we understood him aright, that no artist can do justice to his buildings; however, as our office is to give examples of the architecture of the Victorian Age, the photographer has enabled us to overcome all difficulties and present an accurate view of the premises, which are spacious and well built, and appear to be well adapted for business purposes. The building presents a bold and commanding aspect to the street, indicating at once commercial enterprise and good taste.

LONDON LEVELS AND EMBANKMENTS.—"It will be," says the *City Press*, "as well to glance at the state of things generally as to London levels. The northern embankment will probably throw a heavier tide-wave on the southern shore, throughout the whole length of the over-populated districts of Rotherhithe, Southwark, and Lambeth. Irrespective of the northern embankment, it is quite certain that the southern side needs some better defence than it has; and it is a downright grievous thing that the embankment of the Thames on both shores should be a matter of such difficulty as it is represented. Where's the money to come from? It is a question not of money, but of influence. The northern shore has immense influence, and so it finds a resource in the coal-tax. Let the south side concentrate its influence on this matter, and the money will be forthcoming by some process or other, just as water may be squeezed out of a flint, if you only squeeze hard enough. As a finger-post is better than nothing to people who are not quite sure about their way, we advise the south to hunt up the hackney carriage tax—to lay heavy hands on it, and to call on the whole metropolis to obtain the appropriation of it, first as an embanking fund, and after that as a fund for metropolis improvements generally. It is a monstrous thing for the imperial exchequer to swallow the tax on cabs and omnibuses. A tax upon the shoe-black brigade would hardly be more paltry; and if such a tax is to be defended at all, let it be for local purposes, and to improve the highways on which the tax is earned."

SCULPTURE IN THE INTERNATIONAL EXHIBITION.

BY JOHN GARDNER, ESQ.

THERE is a very prevalent misconception respecting the scope and capabilities of sculpture. Because it excludes colour and perspective, it is assumed to be applicable only to a far more limited sphere than the sister art of painting. A few sentences it is thought might embrace a description of all it can ever aim at or hope to accomplish. Female beauty, manly strength, muscular action, infantine roundness and tenderness,—and these restricted within the conventional forms of Greek art,—and when we have added to these, portraiture, in busts, and statues, we are supposed to have exhausted all the appropriate aims of the sculptor's art. Nothing can be more erroneous. Without discussing or referring to any of the many theories of the beautiful abstractedly, it may be questioned whether it is not wholly fallacious to consider the Greek type of the human form as exclusively entitled to the designation "beautiful." Whatever ethnological doctrines we may be disposed to receive, it cannot be denied that mankind presents, in the most obvious manner, varieties suggestive of not one but many typical forms of beauty, and these abstracted from individual peculiarities, furnish standards to which no one can deny the appellation—beautiful. It would be just as rational for the naturalist to ignore all species of animals, and confine himself to the archetypal idea deduced by Professor Owen from the vertebrata, as the only fit subject for pictorial representation, as for the sculptor to confine himself to Greek models, Cupid, Venus, Apollo, and Hercules—only slightly modifying them to fit on a new nomenclature. Perhaps Greek art may be held to represent abstractedly the species *Homo* and the Caucasian races; but there are other varieties in the human form, running through childhood, adolescence, and the sexes, offering to the sculptor a wide range of beauty and grace for artistic presentation. It is not for us to point out how numerous these races are, or which the power of a sculptor could abstract and re-create. That ordinary observers can see and feel the characteristics of an almost limitless number will not be denied, for a departure from the standard form still confined within the circle of nature, still marked with all her power and perfection, is traceable in peoples divided merely by a mountain chain or an ocean strait. If a sculptor had an eye to perceive and skill to represent the Italian, French, English, or Celtic forms, an abstract beauty might be drawn from each. To take a popular ethnological view of mankind, we have the Japhetic, Shemitic, and Hamyric races as primary divisions, with strongly marked characters, severally susceptible of abstract beauty. The Egyptian monuments present us with three subdivisions of the Hamyric family—the Mizraim, Cushite, and Canaanite or Negro. It is true their artists had neither the knowledge nor the taste to work out an ideal from any of these; but traces of an ideal beauty, particularly of the ancient people of Egypt, are discoverable. It was only the Greeks who attained to any perfection of æsthetic development. But we who have the several races before us need not confine our art within any such limits. How widely different is the form of the Hindoo female from that of the Medician Venus; yet how exquisitely beautiful is the elastic form, the rounded limb, the delicately chiselled countenance of these women; and if the ideal which nature thus offers to us was skilfully rendered in marble, who can doubt the result would rival even the Caucasian model? But to descend still lower in the subdivision, we could point to localities in various parts of the world whence beautiful forms, with peculiar features, might be studied, and varieties of beauty, each perfect, might be educed. There is a scattered people in the island of Ceylon extremely low in the scale of civilization, whose women astonish us by their striking but peculiar beauty. In certain parts of Spain and of France there are localities where a common characteristic form may be found, widely different to the prevailing form of the nation, and suggesting a descent from some eminently beautiful common progenitor, its archetype. We are ourselves so mixed a race, that it might be thought no traces of typical forms could be found in England. But it is not so. Nature vindicates the boundlessness of her resources amid the strictness of her laws, by bringing out of even such confusion of race the several types of our primitive ancestors. If an accurate observer will visit the peasantry of our counties, and watch them as they congregate at fairs or markets, he will still find the characteristic features of British, Danish, Saxon, and Norman prevail in various localities. It appears that even individuals impress a character upon their descendants for several generations, and in many large and scattered families a typical form may be found, and often one of ideal beauty. We have heard a great painter observe that there is that in the nicer traits of face and form which



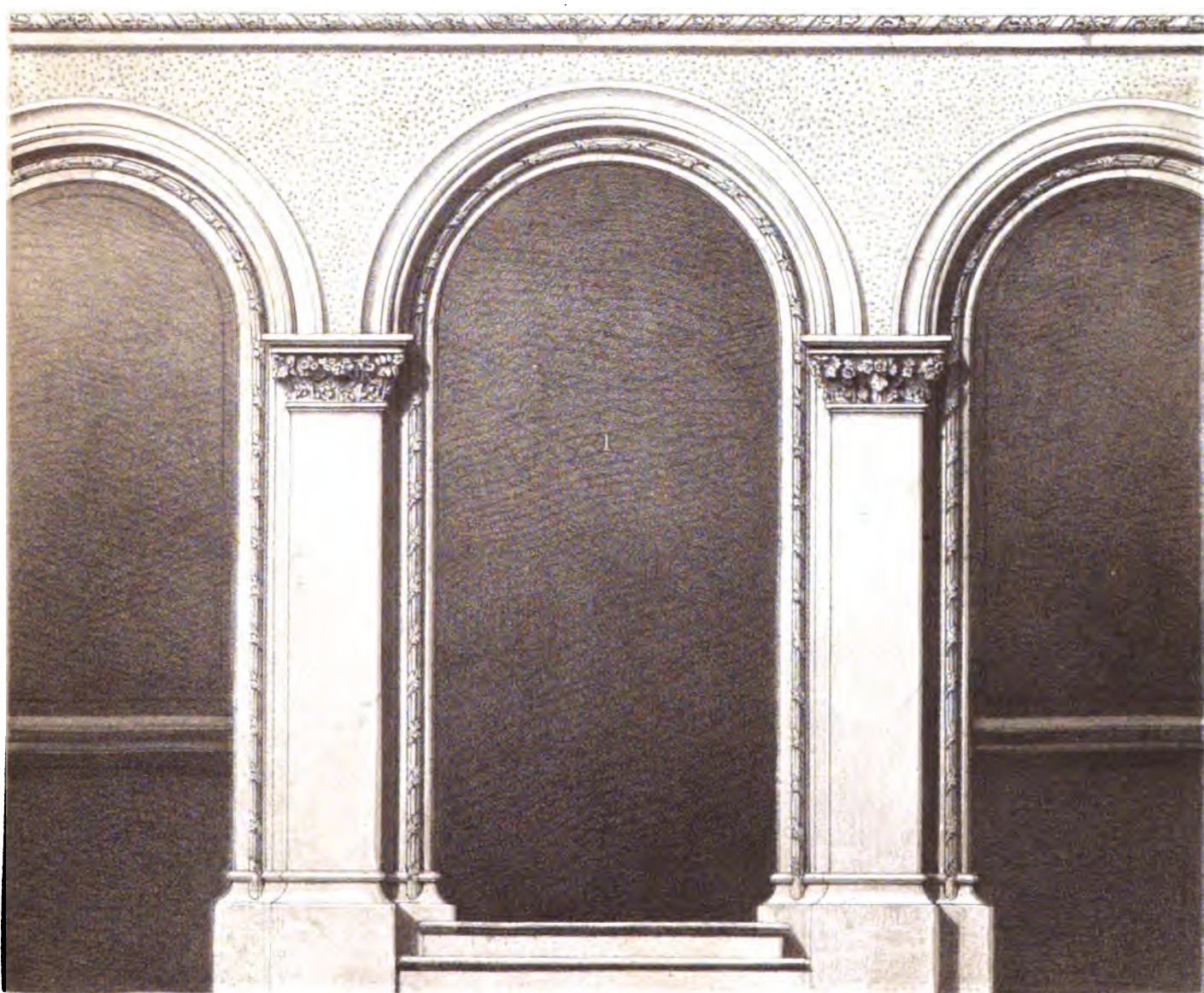
ROBERT DUDLEY, DEL. ET LITH

J. T. KNOWLES, ARCHITECT.

VINCENT BROOKS, IMP.

VIEW OF NEW BUILDINGS IN CHEAPSIDE, (Nos 107 & 108)

DARTON & HODGE, LONDON.



ROBERT DUDLEY, DEL ET LITH

J T KNOWLES, ARCHITECT

VINCENT BROOKS, IMP

VIEW OF NEW BUILDINGS IN CHEAPSIDE. (Nos 107 & 108)

DETAILS

- 1 ARCADE OF GROUND FLOOR
- 2 PORTION OF CORNICE OF SAME SHOWING SECTION.
- 3 MAIN CORNICE.
- 4 CAPITAL OF ONE OF THE OUTER PIERS — GROUND FLOOR.
- 5 CAPITAL OF ONE OF THE INNER PIERS — GROUND FLOOR.

constitute individuality—a species of beauty susceptible of being seized and represented, and producing all the effects of high art. We do not know that sculpture has to any great extent hitherto attempted even to represent the external form of races and families, or seized the ideal of beauty lurking therein. In the International Exhibition we note some recognition of the principle we are discussing. Mr. Storey's two figures in the Roman Court are examples of beauty belonging to the Egyptian division of the Hamyric race. Both the "Sybil" and the "Cleopatra" are, in our judgment, successful and admirable statues—the ideal woman of Mizriam. We conceive that the one designated in the catalogue "Cleopatra," probably in deference to an assumed popular ignorance, is misnamed. We see nothing in this figure suggestive of the beautiful voluptuary who captivated the stern Roman general, shook even the virtue of Cæsar, and agitated the world by her exuberant profligacy. She sits calm, majestic, thoughtful, her splendid limbs and form veiled, yet revealed by skilful drapery, the cares of empire on her brow. She is "every inch a queen"—not Cleopatra, indeed, but the great Queen HAT-A-SU, the sister and co-sovereign of Thothmes II., the regent guardian of Thothmes III., the builder of the finest obelisk of Karnac, and other great architectural works—a woman and a ruler, not passionless, but sternly repressing all selfish emotion she meditates on her high duties, and broods over her deep resolves in an attitude of quietness and silence. When so much is accomplished that is admirable in these works of Storey, he must be the veriest Smellfungus or Dryasdust who can see only defects and minute shortcomings in execution.

Mr. J. Mozier's statue of an "Indian Girl," in the Roman Court, full of character and expression, and modelled from a race as unlike the Caucasian as the Shemitic, well illustrates our position. His "Wept of Wish-ton-Wish," is also Indian, but in this respect is not consistent with the poet, the lost child being Anglo-Saxon, and it is scarcely possible that she should have acquired a form so characteristic of the aboriginal American.

Mr. Spence, in his group, "The Finding of Moses," while recognising the Cushite slave in the attendant on the Egyptian Princesses, has missed the Mizraim character of the latter, and given them the face of Greek women. We shall have occasion to notice another work by this artist, of merit so high that we can only conclude the idea of race did not occur to him in this work, as he assuredly has the skill to represent it.

Again Theed has "Rebecca at the Well," without a trace of the Hebrew woman, whatever otherwise its merits; and nothing from Theed's chisel can be without much to admire.

There is also in the Roman Court a group of statuettes by Benzoni, entitled "Mary asks her Mother to explain the Prophecy of Isaiah." A sweet composition, most delicately executed. The mother is a Jewess, the daughter an English girl.

These hints and illustrations will, we trust, suffice to convey our meaning, and to suggest the existence of a mine whence only a few grains have been drawn, but which teems with incalculable treasures.

We would now notice a conventional notion, having a basis of truth, but wrongly applied, and so far a fallacy, which exerts a great influence upon sculpture, and stands forth very prominently in the works, both British and foreign, in the International Exhibition. The human form is almost, if not altogether, the sole object of the sculptor's art. Its structure, form, surface, and actions, are his constant study. A correct knowledge of these, together with mechanical skill to represent them in marble, constitutes him an artist. True. But when as a corollary, it is added that to represent the form he has so studied should be his sole aim, or that it is his highest aim, we demur to the inference. The sculptor must know the superficial anatomy of man and woman; that is, he must know the muscular structure which underlies the skin and subjacent textures, else how can he represent actions caused by the contraction of the muscles. He ought to know the modifications of the outward surface resulting from the movements of the muscles below it in childhood, in the female, and the male. But this knowledge is not for display, but to subserve the higher purposes of his art. He is a mere pedant, who is for ever referring to the sources of his scholarship and quoting the rules of his speech. He is a pedant in art, who is for ever displaying his anatomical knowledge by representing male figures with the muscles all looking as if stripped of their covering so beautifully contrived by nature to conceal them.

Perraud's statue of "Adam," under the eastern dome, may serve to illustrate this remark. If the first man were so imperfect as to be denuded of the subcutaneous integument common to his descendants, this figure may be accepted.

In like manner we have Milo's "Hercules," "Marius seated on the Ruins of Carthage," and a host of other statues, executed apparently only to show off the sculptors' anatomical knowledge. Are they faultless in even this respect? We would put this question to a practical anatomist.

But the naked female forms, which we cannot separately note because they are legion, do they indicate knowledge or ignorance? Some, doubtless, are as true as they are beautiful, perfectly pure in treatment and graceful in attitude. Others are strangely faulty. Canova's "Venus" in the nave, with cold, regular features of face, is so unwomanly in form, that were she endowed with life she could never bring forth a child; her pelvic development is insufficient.

The selection of naked female forms for sculpture is a vulgar error. It estranges the public from the art, repels the refined in taste, shocks the moral sentiment, and is altogether unnecessary for the display of all that is beautiful and graceful and lovely in woman. Let us entreat the reader to visit the Lycian room in the British Museum, and look at the female dancing figures. There he will see limbs instinct with life and motion, exquisite in form and expression, and yet all so draped as only a perfect knowledge of the naked figure would enable a master to clothe them, and yet do they not convey the impression of exalted ideal beauty?

Drapery seems to be the difficulty and abhorrence of the sculptor. It can be judged of by the unlearned far more accurately than naked figures. If a man cannot truthfully represent the folds of a woollen, a silken, or a linen garment, how can he depict the surface of a human form, male or female? In the latter he may calculate on the spectator's ignorance, and impose on his judgment; but an article of clothing, if ill represented, strikes the eye of every one in a moment. The ever varying fashions in dress, usually ugliness striving with ugliness, are no fit subjects to render into marble. But there is sufficient scope in the poetry of drapery to obviate all difficulty to a true artist. Does any one imagine that the artists of the middle ages, who have left such figures, for example, as those of Queen Eleanor, Madonnas, and children, as we see remaining about Gothic buildings, did not know the naked form? How, then, could they execute womanly statues of such surpassing grace and sweetness? We have often regretted that modern sculpture has not grown out of this, rather than revert to Greek art for its inspiration; we should have been in a far better case than at present, or are likely to be, until nature has become our only exemplar and study!

So much for mere external form as a source of the beautiful and a field for the sculptor. He has also moral and intellectual attributes to study and represent. Feeling and thought are surely illimitable. The expression of these constitutes the glory of "the human face divine." The sculptor who is able to see and represent emotional or mental expression need have no apprehension of not being appreciated. The recognition of feeling is instinctive; an infant detects love in the countenance which is turned upon it, in a moment; the least instructed person seldom fails to interpret correctly the meaning of a look, when moved by kindness, or anger, or dislike. Cannot feeling be presented in marble? If not, the sculptor's art is indeed poor. Intellectual character and thought is more recondite in its influence on external forms, but it is not beyond the reach of the really great artist.

Again, can the incidents of human life, real and imaginary, be reckoned? If they can, then the resulting number is the boundary of sculpture in this direction. When a story is told, either by painting or sculpture, it is understood by a larger portion of the public than either beauty of form or intellectual expression. A moderate amount of mechanical skill here suffices to effect all the purposes of art. When, however, an incident is well told, and the acting figures exhibit high artistic qualities, we have a combination which in one sense surpasses even the most exalted ideal beauty. It is, as we have said, more comprehensible, which is no small consideration when art aims at popularity. "An audience fit, though few," may satisfy a genius like that of Milton, but far more would prefer a wider circle of admirers.

A Belgian artist, Kessel, exhibits a group of three figures escaping from a flood. The story is told truthfully. The figures—a male, female, and child—are beautifully wrought and full of natural expression, the draperies are skilfully managed, and the whole conveys its meaning with great taste and judgment.

In depicting in marble poetic incidents, no one surpasses our own Flaxman. Selecting his subjects from the classic poets, he renders the story into the universal language of the heart, understood and felt by every people. The "Mercury and Pandora" and "Shield of Achilles," "Cephalus and Aurora," are so familiar to every one as compositions,

that we are glad to see once again the originals, of which casts and copies abound.

Woolner's "Constance and Arthur," a very simple group—two children, one draped, the other naked—has excited general admiration. Critics profess to see in the expression of the faces the fact that they represent deaf and dumb children. Certainly there is great merit in the execution; the draped figure is particularly happy. Why the male figure should be represented nude would be inexplicable if we did not know the conventional prejudice of sculptors for nudity.

Malpieri's "Shepherd and his Dog" is a most natural representation. Both the boy and dog are full of life, action, and expression. The combination is highly artistic and pleasing; so much is made of the simple incident as to show how very slender the materials may be to impart pleasure when those qualities are embodied in a work of art.

Theed's "Prodigal's Return" is another incident composition with high merits both of conception and execution. His "Seven Bas-reliefs," each representing an historical story, are already well known and justly appreciated.

Gatley exhibits a large bas-relief of "Pharaoh and his Army in the Red Sea," with enormous labour and skilful execution. This work appears to us to fail in interest. The overthrown host, a confused mass of human figures, horses, and chariots, forms a subject which is wanting in any sentiment calculated to move sympathy.

There are many more sculptors representing various incidents of human life not specially demanding notice, unless we could persuade ourselves to enter on the ungracious task of unfavourable criticism. To so undemonstrative a people as we are, many of these works, even when representing such solemn subjects as the "Entombment," "The Virgin Mother with the Body of Christ," and the like, appear histrionic, spasmodic, or whatever word expresses over-action. These faults, if faults they be, attach to most of the Italian and French compositions. Calmness, simplicity, tenderness, are quite compatible with—nay, are they not inseparable from deep emotion? Art to be of any value must, in representing feeling, even more than form, keep close to nature.

The remaining subject for sculpture—portraiture—is by far the one most followed. It embraces what we may designate mythological and real portraiture, of the latter it has been well said:—

"To portrait-sculptors is committed a high task and a serious responsibility. The nation trusts her great men to them; they are charged to carry down through ages the actual likeness of those who will be to the future what Milton or Bacon are to us.

"We all know how brilliant and attractive are the written portraits of such men, when drawn by some vivid master. Yet there is always a void felt—a sense of blankness and as of the shadows of the grave—if we cannot complete the Book by the Picture. Without this, our heroes were like acquaintances known only by letter; with what penetrative genius in portrait can give, they become familiar friends.

"And we may often most thankfully accept work less excellent, if the likeness be honestly set forth."

Visitors to the International Exhibition have the great privilege, almost for the first time, of examining the busts of the great men of a recently-passed age, as left to us by contemporary sculptors, and comparing them with those of our own times. Among the former, Nollekens stands forth in great strength. We never before have been so sensible of his great merits. There is so much character, truth, force, and careful execution in his busts, that we are as familiar with the faces of his subjects as of our most intimate acquaintances, "Pitt," "Fox," "Lord Liverpool," "Sir Joseph Banks," and others live in our memories as they exist in Nollekens' busts.

Chantrey, the fashionable bust sculptor of his times, like Sir T. Lawrence in painting, has only barely in one or two works left a demonstration that had he not given himself to conventional smoothness and feebleness he might have been a great sculptor, and left works to delight future generations. To us his busts are insipid and meaningless to a painful and repulsive degree.

The question as to how far the portrait-sculptor must adhere literally to his model or idealize? will be answered differently by different persons, according to their ideas of art. Wordsworth, the poet, wished to be known to posterity by Chantrey's bust; yet it neither presented a literal likeness nor an ideal of the poet's face. If compared with Pickersgill's portrait, a literal inanimate likeness, and Boxall's, wherein the poet is reciting his favourite poems, and is animated into an ideal, Chantrey's bust would not be supposed to have any relation to either, or to Wordsworth himself.

We conceive that some faces when idealized are more like than the most literal copy, while others must be represented by the strictest

adherence to peculiarities. The latter is indeed apt to degenerate into caricature, but it is usually most satisfactory to ordinary observers.

Steele's "Florence Nightingale." How can we find terms to express the beauty, sweetness, grace, and expression of this charming bust? It must be like, it *will* be like when in a higher state its original is glorified. No mere form can possibly convey to the spectator's heart such an impression of loveliness;

For there is that immortal grace
Which ne'er shall part from thy possession;
That moral beauty of the face
Which constitutes its sweet expression.

In every respect admirable, this bust ought to teach a lesson to all. To the artist, that dignity and greatness are mental and moral qualities; to the ordinary spectator, that art is worthy of profound study as a source of the purest emotions, as a means of fixing in an enduring material, the evanescent glory, intellectual and æsthetic, beaming from the countenance of a woman belonging to the highest order of her sex.

Butler's "Hon. Mrs. Norton." Here again is beauty inexpressibly attractive—admirably represented.

Weekes's "Mary Woolstonecraft." Feminine gentleness, maternal and household kindness personified. (We do not know whether truthful or not, remembering "The Rights of Women," &c.)

These three busts should be carefully examined. They redeem the sculptor's art from its greatest reproach. They are of infinitely greater worth than a thousand nude Nymphs, Venuses, Girls bathing, and the like, in which sculptors delight, and are calculated to impart to every well regulated mind infinitely more heartfelt pleasure and satisfaction.

Woolner's "Rajah Brooke" and "Rev. F. D. Maurice" are worthy of all praise for their life-like resemblance and artistic merit. His "Alfred Tennyson" we do not like, hoping the "mouthing greatness" is the sculptor's, not the poet's.

We have alluded to mythological portraiture. By this we intend to embrace not only historical personages recreated from imagination, but characters from our poets and novelists, whose images float through our fancy with those of our loved ones and remembered acquaintances. There are some admirable examples in the Exhibition. Would there were more!

Bell's "Dorothea" has long been as familiar to the lovers of grace and beauty as a popular poem. His "Lalage" is a worthy companion. "Oliver Cromwell" is full of character and greatness, but we should have preferred it of the exact size of the real man, and it might have been made so without any loss.

"The Eagle Slayer." Manly strength and vigorous muscular action well and truthfully represented. We would say to Mr. Bell—Look into poetry and fiction for subjects to employ your chisel upon, and patronage and popularity will be sure to follow.

Woolner's "Lord Bacon" shocks us at first by its diminutive figure, but the feeling passes into admiration as we gaze and reflect.

Spence's "Jeanie Deans before Queen Caroline." We have only here the figure of Jeanie in the well-known act of supplicating for her sister's life. We deem this a most successful statue. We know that it produces on the spectator the almost choking sense of anxiety and sympathy, conveyed by the narrative of the great Scottish magician, and we do not envy the critic who can coolly occupy himself in looking only at a fault in the drapery. Having had occasion to point out a defect in this artist's more ambitious group of the "Finding of Moses," we have the more pleasure in expressing unmingled satisfaction in this charming representation of one who, with Scott himself, we must confess "is a great favourite of ours."

Thus we could proceed over a department of art far more extensive than is generally supposed, but we must pause, far from having exhausted the subject as it is represented in the International Exhibition. Upwards of a hundred sculptors have sent works to this great collection. We can only in conclusion express a fervent hope that our scanty remarks and faint hints will induce many a thoughtful person to turn his attention to sculpture, and increase the number of those who can appreciate genius and skill, and extend the number of patrons of an art calculated to gratify, instruct, and elevate mankind.

THE Emperor of the French is still actively engaged in writing the account of the conquest of Gaul by Julius Cæsar. He has sent one of his aides-de-camp to Boulogne-sur-Mer to ascertain the exact position of the *Itius Portus*. Antiquaries differ in opinion on this subject. According to Walkenaer, that ancient Gallic port was situated at Wisant. Others place it at Ambletense or at Boulogne. Others are of opinion that it was more to the north—at Caylis, or at Mardyke. All these contested points are to be cleared up in the Emperor's work.

FOREIGN ARCHITECTURAL DESIGNS IN THE INTERNATIONAL EXHIBITION.

THE student of architecture will meet with disappointment if he expects to get from the collection of works of this class of Art, vouchsafed to be sent by our neighbours, any idea of what is really going on amongst them. A bald hint or two is all that will be obtained. First, to characterize the movement fostered for anything but architectural purposes by the French Government, may be found some drawings of ancient buildings, and of the restorations effected upon them. Under the general direction of the most accomplished architect of the age, M. Viollet-le-Duc, less mischief has been done than might have been feared. Yet, as this gentleman cannot be everywhere, and by far the greatest portion of the work is entrusted to subordinates, terrible havoc has, beyond all denial, been effected upon many a noble building, such as shall never again look fair in the student's eyes. What M. Viollet-le-Duc has effected at Carcassonne architects know well; here is a work thence, the "Church at St. Nazaire" (17), contributed by M. Huguonet. M. Penel sends, after the same, an engraving of the "Church of St. Saturnin" (26), a good example of restoration; M. Soudain, the same, after the same, of the "Church of Eu" (19), with its interesting apsidal chapels and flying buttresses. The "Church of Poissy" (20), contributed by the same, after the same, also looks bald enough. M. Sauvageot's "City of Carcassonne" (21), after M. le Duc, is a mine of study for architects and amateurs, who will find much to astonish them in the work referred to. We would ten times rather see the old, ragged, time-worn "Church of St. Michel d'Entraignes" (14), which is shown after M. Abadie, by M. Guillaumot, in both the restored and actual states, in its ancient aspect than in the smug, mean-looking modern attempt at galvanizing a time-worn edifice. This section shows one phase of the present state of French Art—i.e., restoration, which, let it be borne in mind, appears here in its sole pardonable aspect.

A second phase, that of the attempt to reconstruct something that is bizarre, and out of the common road of art, may be seen in M. Normand's drawings of "Prince Napoleon's House" (31-2). Like all our neighbours' work of the kind, this is exceedingly cleverly done. The theme has been mastered with a gay felicity, so to say, which, if it does not go very deeply into the soul of old designs, gives a startling re-edification of its material parts. We should like much to see the building in question, which has peculiar points of interest, more fully treated than it appears in these two drawings. The one is a door in the *atrium*, certainly very rich and bold, and decorated with perfect taste; the other, a portion of interior wall decoration, made extremely satisfactory of its kind by judicious employment of blue, red, and black, the last as a dado on the wall, the whole relieved admirably by characteristic decorative painting. M. Denuelle's studies from old mural paintings at Avignon and Autun are extremely interesting, as examples of the Mediæval decorations of a school not much studied by our polychromists.

A third phase of modern French architectural art finds expression in several engravings from designs now in course of erection or recently completed in Paris and elsewhere in the style of Napoleon the Third—so, we fear, this astonishing revelation will be called, and be condemned in times to come. It is viler than the most corrupt of the Louis-the-Fourteenth manner, because it has not the splendour that shone through all the vulgarity of that age. It is more unmeaning than the poorest modern Renaissance, because, with a *fanfare* of purpose, its decorations mean nothing, and yet have not the slightest claim to the miserly merit of cheapness. Not severe, like good Classic,—not rich and varied, like good Gothic,—not grand, like Lombardic,—nor cheap, like modern Italian,—this style has not the conventional grace of the Palladian, its much-abused parent, and will only remain to be condemned as trinketty, and a hollow sham from parapet to wall base. We commend to the student the volume entitled "The Brick Architecture of Prussia" (501-2), with fine examples from Osterburg, Stendhal, &c., and the designs from Hamburg, by MM. Meuron and Haller (557).

TO MAKE HARD WATER IN CEMENTED TANKS SOFT.—Sir: For this, Nature most appropriately supplies the best remedy by the growth of that green lining, which some occasionally so inconsiderately remove; and, as a result, their previously soft water again becomes hard. I would suggest to your correspondent to place in the tank some *conferva*, such as the green coating off the walls of a well; and, if this will but fix itself on the sides of his tank, he will find it effect a costless and "perfect cure."—PETER HINCKES BIRD, F.L.S.

ARCHITECTURAL LITERATURE.

AN EVENING IN THE SOANE MUSEUM.

BY PROFESSOR SMIRKE.

THAT Sir John Soane was perfectly aware of the importance to every architect of a thoroughly practical knowledge of building is sufficiently apparent from the contents of his library, and was repeatedly dwelt on by him in the lectures. But it is to his books on architecture as a fine art that I am bound here to confine my attention, and it is certainly to the works of this character that the library owes its chief attraction, and from them it derives its chief value. It comprises nearly every architectural publication of value that appeared during his own professional career, down to the period of his death in 1837, as well as a large store of books of early date.

Among the earliest in the catalogue you will find Alberti's "*Libri decem de re Edificatoriâ*." Of this well-known book there are here six editions, but among those I do not find the original and earliest Latin edition of 1512. A folio edition, in Italian and English, appears to be that which its owner read with greatest ease, as it contains many marginal notes by him, and other evidences of his having carefully read it.

On a former occasion I have expressed my admiration of Alberti's works at Rimini and elsewhere. His church of San Francesco is in the best style of the early Renaissance, before it had degenerated into the commonplace manner of the following century. It is worthy of note, that Vasari touches but slightly and with some apparent indifference upon the work, although he must have been especially familiar with it, seeing that Vasari dwelt some time in Rimini. In truth, Vasari, excellent as he may be as a biographer, had, as an artist, but little genius; and he was unable to appreciate the somewhat dry, antiquated manner of Alberti. That artist not only possessed undoubted talent as a practical architect, but remarkable merit also as a writer. His book is full of valuable remarks, and attests at once his good sense and his erudition. What is also specially worthy of our observation is, that he appears in an eminent degree to have united a minute and accurate technical knowledge with a fine æsthetic feeling. The distinction which he draws between *beauty* and *ornament* is, I think, most just and true. "*Beauty*," he says, "*is something lovely, which is proper and innate, and diffused over the whole body; whilst ornament is something superadded, or adventitious rather than innate.*"

Alberti, and I might say Alberti's school,—the school of the early Renaissance,—well understood the distinction between beauty and ornament. The vulgar of all ages, countries, and ranks, are apt to think that ornament means beauty; and that in order to be beautiful we must needs be lavish in ornamentation. This great error leads directly to that excess which degrades art, whether it be architecture or her sister arts. It was excess which marked the decadence of Roman and of Mediæval art; and it was the disfigurement of excess which stained the purity of the early Renaissance.

The next book which comes to hand is of a very different character. Indeed, one is sometimes almost led to feel surprise how books so widely asunder in their character and quality can submit to the close and constant juxtaposition that they are subjected to on our bookshelves.

The book, I say, which I now take up, is Dietterlin's "*Architectura; de Constitutione, Symmetriâ, ac Proportionibus quinque Columnarum*," published at Nuremberg, in 1598. It bears sad testimony to the rapid deterioration of art, and to a special proneness to a corrupt excess among our German neighbours.

In the extravagant and grotesque scrolls and cartouches which abound in this volume, we see at once from whence were derived the strange ornaments of our Elizabethan and Jacobite styles; although those styles, as displayed in our own country, might lay claim to the character of simplicity and sobriety by the side of these wild enormities of Dietterlin.

I find on the shelves a volume of drawings, chiefly executed on vellum, described in its manuscript title as "*Disegni di Architettura del Anno 1400*." It is a curious volume, of the history of which I know nothing, although of its authenticity, for various reasons, there can be, I think, no reasonable doubt. The execution of the drawings is very indifferent, and there is little attempt at correct delineation; and yet there is not wanting freedom and a certain amount of manual and almost artistic dexterity. The volume seems to do for the fifteenth century what Willars de Honcourt's book of drawings, recently sub-

mitted to the Institute of British Architects, does for the thirteenth century.

There are between sixty and seventy drawings, but none bear any titles, and they are probably original studies or exercises in architectural and ornamental design. A very little correction and modification would make some of these designs elegant compositions. There is not, I believe, a single instance in the book of a dominant order determining the proportions of a building. Columns there are in abundance, and of a great variety of whimsical forms; but in all cases, I believe, each tier of columns and arches represents a separate floor. A constant use of arches and niches, a prevailing habit of panelling and enriching the panels with arabesques, as on the sides of square columns and pilasters; and a habit of covering all vacant spaces with square and circular panels and medallions, filled in either with slabs of coloured marble, or with foliage, generally in somewhat flat relief; these appear to be the prevailing distinctions of the quattro-cento style, which stands out with very marked differences from the style immediately preceding and succeeding it.

Another book which I must not pass by is a fine copy of the earliest edition, "Philiberte de l'Orme's Architecture," bearing date 1567. Under the auspices of Catherine di Medici, he may be regarded as the introducer of the Renaissance into northern Europe. She came of a race eminently distinguished in the history of art; and the author, in his dedication, eulogistically refers to her as delighting in architecture, and as sketching with her own hand the noble palaces which she caused to be erected.

It is curious to find at this early period the author groaning over the degeneracy of his profession, and complaining how few *true* architects there *then* were. Some self-styled architects were, he says, but mere "master masons," whilst others were but geometricians, or men addicted to the literature, but neglecting the practice of their profession. His imaginary portraiture of the beau-ideal of an architect savours of the quaint, allegorical taste of his time.

He would represent an architect, he says (and there is an illustrative diagram of such a man), with three eyes—one, for the observation of Divine things and the works of God; the *second*, for the careful observation of things present and around him; and the *third*, for looking into the future, foreseeing, and so providing against, coming evils. He should also have four ears, indicating that it more behoves him to listen than to speak. Four hands should be given to him, that he might be the better able to do all that is required and expected that he should do; whilst his feet are to be winged, pointing out that he must be of quick intelligence and rapid in action. There are many other things worthy of observation in this curious volume, but I must hasten on to others.

I find a volume of original drawings by Carlo Fontana, formerly in the library of Paine, an eminent architect of the last century. It represents the state at that period of the Coliseum at Rome, and Fontana's supposed restoration of it, with his suggestion, certainly not a happy one, for the erection of a church within the area of the amphitheatre, to be dedicated to the Christian martyrs who suffered there. I need scarcely say that this monogram on the Coliseum is greatly inferior to that unpublished work on the same subject existing in the British Museum, to which I before directed your attention. These drawings of the seventeenth century, by Fontana, are very neatly and ably executed, quite free from the dry hard manner prevalent among architects at a later date. The lines are in brown, and the shadows delicately indicated, with a cool, neutral wash, probably Indian ink, or some colour equivalent to it. This mode of execution was retained throughout the last century, for I find here a large folio volume, containing original drawings by Wren and others of his time, which are all similarly treated. Some also in the volume attributed to Inigo Jones are so executed.

Among the treasures which Sir John considered to be worthy of a place in the strong-room of his museum, I find a Roman missal of the early part of the sixteenth century, illustrated with miniatures of the greatest delicacy by Lucas van Leyden and his scholars. It is worthy of remark that all the architecture and ornamentation with which these miniatures are elaborately enriched are throughout very distinctly Gothic in style; *late*, it is true, but without any admixture of classic taste; and yet this artist died in 1533, and was therefore contemporary with Raffaele and Giulio Romano. The co-existence of two schools so remote in character and spirit, yet geographically so near, as Flanders and Italy, shows how little social intercourse could have existed in Europe at that period. Whilst admitting his merits and superiority to others of his school, Lucas von Leyden is described

by Fuseli as "ignorant of light and shade in masses;" and his forms are condemned as "lank, meagre, and ignoble;" and yet this artist was studying and painting within what is now a day or two's journey from the easels of Leonardo da Vinci, Michelangelo, and Raffaele.

There are, I trust, few architects who are not aware of the beautiful work preserved in this same strong closet, known as the "Commentaries on St. Paul's Gospel," by Marino Grimani, illustrated by the beautiful illuminations of Giulio Clovio. This work, certainly the gem of the collection, presents a curious contrast in its architectural accessories with that to which I have just adverted. The style is strictly Raffaelesque, with medallions and arabesques such as we see in the loggia of the Vatican. I cannot pass from this magnificent and almost priceless manuscript volume without adverting to the elegant character of the handwriting. When we look upon the beautifully-uniform, clear, well-proportioned, deliberately-shaped, and, I would almost say, *dignified* style of the lettering, and compare it with the calligraphy of the nineteenth century, in which the words look often more like the hasty unmeaning scratches of a bad pen than the expressions of a man's thought and sense, it must be admitted that the lapse of three hundred years has brought, in *this* respect, at all events, no improvements whatever.

Descending, now, one hundred years, we come to the sketch-book of Inigo Jones—not the original book, it is true, but an admirable facsimile of it, presented to Sir John by the late Duke of Devonshire, the owner of Inigo's own handiwork. It is not for me to dwell on this sketch-book, as it consists exclusively of studies of figures and drapery. The book bears date at Rome in 1614, when the great architect was about forty years old. I cannot refrain here from adding that the motto which graces the first page of this sketch-book is "*Altro diletto et 'imparar' non trovo*" (I have no pleasure but in acquiring knowledge); a sentiment which does high honour to Inigo Jones, and one which should never be absent from the mind of an artist, be he young or old. When a man has reached the period at which he imagines that he has learnt his art and needs no more teaching, he may rest assured that he has fallen fully into the sear and yellow leaf.

In an evening devoted to the literary bequest of Sir John Soane, it seems natural that I should not altogether abstain from touching, for at least a few minutes, upon that eminent professor's own peculiarities of architectural design. Although we may very wisely abstain from the remotest criticism on the works of contemporary artists, that salutary limitation has long ceased to exempt Sir John's works from the free comment of the critic. Upwards of a quarter of a century has passed away since his death.

I have, however, no inclination nor intention to use the lash. I would but remark, generally, that a constant endeavour to seek out picturesque effects, especially in the design of interior architecture, seems to have led to much of that eccentricity of manner which most critics are inclined to condemn in his works, although it may be found to have resulted in some ingenious combinations, and perhaps, occasionally, in some original conceptions.

THE ETRUSCAN TOMBS.—From an article published by the *Revue Contemporaine*, the following particulars are extracted:—After some researches, Mr. François informed Mr. Desvergers that on the embankment of Fiora, at Vulci, at an altitude of 90 ft. above the river, he had bored the ground, and found an artificial grotto presenting none of the characteristics of a sepulchre, and which was probably intended to protect a more important crypt from the effects of infiltration. A shaft was therefore sunk to the depth of 36 ft. below the surface, when a subterranean passage was discovered, 9 feet in breadth and 99 feet long. This being cleared, the pioneers reached the door of a hypogeum. When the first gleam of light from their torches revealed the interior, they saw warriors clad in armour lying on their sarcophagi: the forms, the vestments, stuffs, and colours remaining visible for a few minutes, until the air from without gradually penetrating into the crypt, effaced the whole. All that remained to the persevering explorers were the weapons, jewels, bones falling to dust, and a few threads of gold and silver which had been woven into their garments. The walls were, however, covered with paintings representing an episode of the "Iliad," and of very superior execution, evidently pointing to the influence of Greek civilization in Etruria. The crypt had eight entrances, all adorned with the peculiar Etruscan mouldings which Vitruvius calls *barycephala*, or top-heavy. The inscriptions were ascertained to be of a period anterior to that of the conquest of Etruria by the Romans. Mr. Desvergers therefore concludes that this tomb dated from the fourth century before our era. Some of the treasures now in the Musée Napoléon III. belonged to this tomb.

REVIEWS.

EPHESUS AND THE TEMPLE OF DIANA.*

If any author wishes to see his ideas clothed in the richest attire that printer and publisher can dress them in, we advise him by all means to get into the good graces of Messrs. Day and Son, who are likely to satisfy the most intense vanity that authorcraft can aspire to. Everything that pictures in plain and coloured lithography, the finest and thickest paper, new type, and elegant binding can offer to win the fickle jade Fame, is supplied at this establishment. As a matter of course a large circulation is not to be looked for, on account of the great expense of the works; still we suppose it pays well. In a country so wealthy as England there are always many people who can afford to buy expensive publications, and whatever form they were issued in, such works as that before us can never be popular except it be in a very limited circle.

Mr. Falkener is a learned man and a very clear and elegant writer. Throughout, his work is written in good sound English, except when the author allows his classical phraseology to render him unintelligible to common readers without the aid of a lexicon. Such passages as the following are pedantically absurd:—"The distance from Ephesus to Susa was four hundred and sixty-eight parasangs, or fourteen thousand and forty stadia; in this distance were one hundred and fourteen stathmi, or mansions with excellent inns; these were all splendid and beautiful." (p. 127.) Why could not the author have given us the number of English miles instead of the "fourteen thousand and forty stadia?" It is high time that scholars should throw away their stilts, and take to the easy and graceful motions common to simple travellers on the road of knowledge.

But in spite of many such defects as those hinted at above, the volume is not only readable, but interesting, and taken as a digest of what was already known concerning the once famous city of Ephesus, its temple and goddess, "whom all Asia and the world worshipped," is a valuable contribution to our literature. Generally speaking, also, we believe the plans of the city and its environs to be tolerably correct—as nearly so, at all events, as anything but actual exploration can make them. But after saying this, and thanking the author for the pains and industry as well as learned ability which he has displayed in collecting together and collating whatever is to be found in ancient authors respecting it, we know next to nothing at all about the matter. The world-famed Temple of Diana has disappeared so thoroughly as to leave no vestige behind to indicate the spot on which it once stood. It is probable, but not certain, that Mr. Falkener has pointed out the locality, but his, after all, is only a probable guess. He has been able to indicate the character of several of the other public buildings, and has corrected an error or two which previous travellers had fallen into, but he made no effort to exhume the temple. Of that he saw no trace.

What we know in reality about this ancient city may be told in a very brief paragraph:—

Two thousand years ago there existed on the banks of the river Caystrus, on the shores of the Mediterranean Sea, an ancient and very populous city named Ephesus. The plain was covered with public buildings vast and magnificent as any in the world. The theatre was large enough to afford accommodation to 56,700 spectators, which is nearly twenty times the number that any similar building in London will hold, whilst the stadium or place of public assembly would seat seventy-two thousand persons; the gymnasium and other public edifices were upon a scale of equal grandeur. But Ephesus was not renowned for any of these things, the Temple of Diana throwing them all into the shade. Upon this trophy of art Asia had lavished its wealth and the world its genius. Destroyed seven times, it had risen every time more beautiful from its ashes; it was at once the wonder and glory of the ancient world. The inhabitants of the city, which must have numbered many hundreds of thousands—perhaps more than a million—were reckoned amongst the most learned, skilful, and enterprising of an age when the culture of Greece had reached its highest state of development. The plain then being covered by those immense piles of public buildings, the people built their houses upon the hill-sides which rose above them, thus clustering round those eminences in a healthful situation, under the most beautiful sky in the world, with a river winding through the lower part of their city, and the blue deep

waters of the great sea stretching out before it, with varying fortune, the common lot of humanity for more than a thousand years, reposed the magnificent city of Ephesus. But all this has perished: not a single habitation has survived the blight of time; the houses are all gone, the very outline of the public buildings can with difficulty be traced; the harbour, which once held a vast navy, is filled up with deposits from the river, until the sea has retreated from its ancient boundary, and the very site of the temple is unknown. Neither is it easy to make excavations in search of its foundations. The marsh in which they are supposed to be buried is full of venomous reptiles, and the malaria arising from the spot dangerous to human life.

These are the general and leading facts known about this celebrated city. Of course, in collecting all the statements of ancient authors respecting it, Mr. Falkener has been able to give us a number of interesting particulars not hinted at in our summary, but they amount to little, and will necessarily be received with a certain degree of reserve until more is known concerning the locality of the Temple, for whatever faith we may have in what the Greek and Roman authors have said, they have left so much unsaid, that we must suspend our judgment respecting the Temple, at all events until some one with the pluck and ability of Layard shall take the matter in hand. For this undertaking Mr. Falkener is evidently not the man. He spent a fortnight at Ephesus seventeen years ago, and was busily employed in sketching all the time; and beyond removing a few inches of earth from the tops of some half-a-dozen columns, attempted nothing in the shape of excavations. He was evidently afraid of the fever and snakes, and was too timid to venture into the subterranean vaults of a large public building, although they stood invitingly open before him. Hence we feel a disappointment in looking over his elegant volume, which the author must have anticipated when he wrote such passages as the following. Speaking of Pliny's description of the Temple, he says:—"Thus, as Salmassius observes, 'we are not certain of any one thing, notwithstanding all that Pliny and Vitruvius have written on the subject; we know neither the nature of the building, nor when it was erected, nor by whom.'" A sad conclusion, certainly, to a well-written, elegant, and expensive volume.

Of the great goddess Diana and the image that fell down from Jupiter, our information is about as scanty as it is respecting the temple in which she was worshipped. The figure given at p. 286, from an image now in the Museum at Naples, is probably only one of the many forms under which the goddess was represented; Mr. Falkener's chapter respecting her is, however, well worth reading. Nor is it likely that we shall ever have any great increase to our knowledge of this matter. The Iconoclasts have done their work too effectually to allow us any reason to hope that a single work of art which once adorned this celebrated shrine has survived their destructive hands.

But what has become of the Temple of Diana no one can tell. The probability is, that some fanatics of the fourth or fifth century, in their zeal against the ancient faith, razed it so as to leave not one stone upon another. But even of this we are not certain. We know that it was standing in the fourth century of our era, but it vanished like a shadow, no one knows how or when.

THEBES AND ITS TOMBS.*

To the tomb we have often been indebted for particulars as to the history of the past. The spoils of the dead brought to light by accident or research, the ornamentation of the sepulchre, and the graven record on stone or brass, have enabled us to find our way to the social condition of generations of men who have slept for centuries; their manners, customs, arts, superstitions, to their religious ceremonies, laws, and long portions of their history. Greece and Rome have yielded their contributions in this way in funeral urn, in monumental stone, in sculptured altar, in the coin dug from the forgotten tomb, in the paintings found on the walls of the buried city, in the broken pottery found in the bed of a river, or the utensil of bronze turned up by the ploughshare. But to the history of the past no country has contributed so largely in its monuments and tombs as Egypt.

It is to "Thebes and its Tombs and their Tenants" that the present learned writer addresses himself; and his work will be found a valuable contribution to our general knowledge of ancient Egypt. The materials for it were collected five years ago, but the publication was deferred for reasons explained in the preface, and every indulgence must be extended

* *Ephesus and the Temple of Diana.* By Edward Falkener. London: Day and Son.

* *Thebes, its Tombs and their Tenants, ancient and present, including a Record of Excavations in the Necropolis.* By A. Henry Rhind, F.S.A., &c. London: Longman and Co. 8vo, pp. 329.

to the author in a literary point of view, when he informs us that he has had to correct two-thirds of his proof-sheets about fifteen hundred miles from England. He is prepared to find that his views may not be in accordance with those who have already written on *Ægyptological* subjects; but where he has had occasion to dissent from the opinions of writers of distinguished merit, he has always done so with a sense of the consideration due to deductions that may appear to be the product of thought or learning, and sometimes with diffidence as to the views which he may present himself.

Thebes he treats of introductorily as the ancient capital of Egypt, and chiefly as the central source which has been archæologically so productive.

In eleven chapters the whole of his present subject is comprised, and a brief analysis of these chapters will prepare the reader for the materials he has to consider when he takes the book in hand. Thebes is the subject of the first chapter, wherein we have an account of the present aspect of its site. Luxor and Karnak are brought before us, the former with its great temple and obelisk, the latter with its avenues of sphinxes and bulls, and massive portal towers; all is prominent but solitary. The antiquity of Thebes itself is discussed; no exact date can be as yet assigned for its foundation, but it was in a flourishing condition 2000 B.C. perhaps. It had its decline and its fall, and early Greek writers saw the city before the latter event happened. Sculptures and frescoes afford evidence as to what were the manners of the people and their general civilization at the period of its glory, but as to the appearance, structure, and special characteristics of the city of Thebes itself, they offer of evidence almost or absolutely none. But the social and public life of a people is intrinsically more worthy of being known than the form of a city, though that in itself is highly interesting. Saxon "Life in London," could we ascertain it, would be infinitely more interesting than a description of the ancient walls of London, its barbicans and gates, and the course of the Wall brook and the river Fleet. So these frescoes are more interesting than a plan of Thebes. "Thus," says the author, "all the labours of tilling and reaping are often depicted with an accuracy so scrupulously minute as regards the actors, that touches are introduced into the picture almost superfluous, save in the eyes of a very honest copyist. . . . At one corner of such a field-view may perhaps be seen a thirsty gleaner on his knees, drinking from a water-skin suspended on the lower branches of a tree; at another point a colley, or cur, stands with airy impudence at the heel of his master the overseer, who leans upon his staff. . . . Again, a yoke of oxen with curving neck and steady step bend willingly to the plough, but there is not a trace even of the furrows which they are making. Hounds and huntsmen, with the lasso and the bow, pursue the flying and wounded deer, whose drooping head and faltering step are sometimes rendered with pathetic simplicity. . . . A king on his throne receives the homage of his subjects and the spoils of his enemies, but the palace, the temple, the hall, or the court where the ceremony is held, is not attempted, or only, as in a few cases, by the confused insertion of a stray pillar. A festive party enjoy the luxuries of a hospitable feast, listening at the same time to bands of music; but the chamber in which the banquet is spread is left to imagination. Craftsmen of every kind diligently ply their trades; the materials they employ, the tools they use, even the manufactures they produce, are minutely set forth; but the workshops in which the various processes were performed have no place." What is wanting in these "*tableaux vivants* without the scenery," we should like to have had; but they are books without the covers, and we should have regretted more the loss of the book than of the binding, however grand or gaudy. Enough remains in Egypt to give us an idea of the grandeur of its architecture, its temples and palaces; but, for the history of ancient Egypt, one would rather have the frescoes of the tombs than the sphinx or the pyramids. Nevertheless, there are paintings which, in a rude way, afford us some idea of the domestic architecture of the Egyptians. "The paintings show some to be mere quadrangular cubes pierced by a doorway with fillet and bead mouldings, and by one or two corresponding windows, answering to a height of two storeys. The loftiest of which any example is given cannot be set down at more than three storeys; and its exterior is much more ornate. In this case, spaces not occupied by windows are panelled; and slender columns rise from the ground to the flat corniced roof, which rests upon short pillars springing from the walls, thus forming on the top a sort of verandah sheltered from the sun and open to the cooling breeze. Other houses, surrounded by gardens and pleasure grounds, laid out with ponds and trees, had massive gateways or pillared porticoes; and confined apparently in great part to the height of one storey and a basement, they were spread

over a more considerable space." But the extent of the city and its general aspect cannot be gathered from fresco subjects. As to the extent of the city, Diodorus gives it a circuit, in Greek measurement, equivalent to sixteen English miles. After comparing the accounts of different authorities, the author comes to the conclusion that an average segment of the ground on which Thebes stood would measure from four to five miles. Streets and squares have disappeared, but enough remains to testify that Thebes, in the zenith of its glory, must have been a vast Egyptian city, not much smaller in area than modern London.

The second chapter brings us to the Necropolis of Thebes. "Its great extent, and the elaborate nature of many of the tombs, would also, if the temples had been levelled and history silent, be very certain evidence of the size, magnificence, and resources of a city whose people, being dead, yet speak thus far through the medium of their vast abode." The author dwells upon its nature and appearance, describing the situation of the tombs, the tombs of the kings, the periods to which the various tombs belong, the tombs of various descriptions intermingled; and, alas! for the intermingling of poor humanity with the brutes which perish—in a ravine near the Valley of the Tombs of the Queens mummied apes used to be discovered. At other points mummied fish, cats, snakes, and cows have been found. The author has known drawn from a sunk tomb, many hundred mummies of hawks and ibises, carefully rolled in ornamental bandages, to be procured along with jars of white eggs, probably of the ibis, and sundry small boxes, each containing a mummied mouse, whose effigy, cut in wood and in some examples gilt, was stuck on the lid. Well may he expatiate upon the present death-like appearance of the Necropolis. The traveller beholds the desolation of the dead, the ruins of mourning, the torn fragments of materials once consecrated by affection or superstition, shreds of the fine linen and remnants of the gold ornaments which swathed the wealthy, of the coarser linen and idols of clay which were wrapt around the bodies of meaner men, the *débris* of papyrus rolls inscribed "with ritualistic guidance for the soul's career," beads and beetles, and precious stones dropped from the undertaker's network, the wrecks of pottery which contained once the viscera of the deceased, and baskets, stools, bows and arrows, fish-hooks, bread, corn, roasted ducks, and even such children's toys as one sees even now enclosed in a monumental stone at Montmartre or Père la Chaise.

The third chapter is devoted to the results of former sepulchral researches among these tombs, and the fourth gives an account of the unfired tomb of a Theban dignitary and its contents. This is a most interesting chapter, as it gives the results of the author's own personal researches. Here we are on actual ground—that is, the objects uncovered were sterling realities of the past, and not the manufactured shams which modern Arabs sell to curious but ignorant Europeans. Here appear to have been entombed Amunoph III., and the princesses of the family of Thothmes III., judging from the cartouches and tablets which were found. As passage or gallery one after the other is explored we read with unabated attention. We come to a door remarkable from its strength and the perfect freshness of all its parts, including two wooden pin-locks of the kind now used in Egypt, the iron nails, with large heads, with which it was fastened together, and staples of the same metal, in which a bar slipped to and fro. Then, at length, we come to a well-like pit. Reared above it, an erection supporting strong beams, over which the very rope of twisted palm fibres still hung, that had lowered to their resting-place the tenants of the sepulchre beneath, "appealing with striking force to the imagination, and presenting one of those telling pictures which, from the very simplicity of their details, are often the most suggestive exponents of the acts in which they have borne a part." We must refer the reader to the book itself for an account of the discoveries made here, even down to the old slipper which was thrown after the dead to invoke his speedy transit to immortality, even as now, an old slipper is cast after the newly married pair to invoke good luck.

The rich had their burial-place and so had the poor. They often lay as far apart as do now the consecrated from the unconsecrated; and Chapter V. tells us of their mode of burial. The excavations directed under the superintendence of the author disclosed, in the pit, groups of coffins and mummy-cases, the narrow boundaries of the dead,

Packed to humanity's significance.

Few fine coffins here. The poor man and the pauper have in all ages fared alike when they have shuffled off this mortal coil. Coarse bandages for the poor inhabitant below, a coarse embalming process,

no gilt, not much painting. "By far the greater number of the bodies in this burial-place were encased in mere shells of roughly smoothed deal, fastened with wooden pegs, and tapering like a large truncated wedge from one end to the other." Perhaps there were undertakers in those days who made contracts with the parish as it were; at all events, many instances were found of the bodies of young persons in coffins much too large for them, and in others the bodies lay with an inappropriateness that showed a want of identity with their coffins. Still, from the numbers found in these tombs, there must have often been a friend or relative to fling an old shoe or slipper after the departed poor man or pauper.

Chapter VI. relates to excavations among tombs of various grades, and here the interest of the work is still continued. We have an account of the tombs of kings and meaner men, and of the curious relics found with the dead. Chapters VII. and VIII. treat on the theories explanatory of Egyptian sepulture—the sepulchral evidence on early metallurgic practice. The metempsychosis is considered, the Egyptian conceptions as to the transmigration of the soul, and objections made to modes of attributing embalmment to a belief in a resurrection. These are matters which we cannot here enter upon.

The remaining chapters—the ninth, how the demand for Egyptian relics has been supplied; the tenth, on the present tenants of the tombs; and the final chapter, on the present tenants of the tombs and their rulers—will amply repay perusal. There are tricks in all trades, so it seems there are among dealers in the relics of Egyptian tombs. Dealers in ancient coins in Rome are said to fabric imitations of ancient ones, and to submit them to the digestive process of the goose. The coin is voided, and having its asperities smoothed by the action of gastric juice, is purchased by a goose as a genuine Augustus or Nero. Similar tricks are practised in Egypt. The chapters relating to the "Tenants of the Tombs" will engage the attention of the philanthropist and politician.

We fear that, in the space to which we have been obliged to limit ourselves, we have hardly done justice to this valuable work. Apart from its facts, surmises, theories, and inductions, it is written in a clear and pleasant style; and we must not omit to state that the many illustrations will greatly assist the reader in fully comprehending its descriptive contents. We trust soon to have more from the same able and learned pen.

PALGRAVE ON THE FINE ARTS.*

A VAST amount of discussion, not of the most amiable kind, has arisen out of the circumstance of the Royal Commissioners of the International Exhibition having given their sanction to Mr. Palgrave's little book of criticism on the specimens of the fine arts which are now to be seen in the Exhibition. Mr. Palgrave is a critic of the earnest—we might almost say—of the fierce order. He travels too fast to be a safe, much less a philosophical guide; still his book has many merits, not the least of which is that it is earnest, truthful, and independent. The author not only means what he says, but says what he means in good plain English. Take the following as his definition of the spirit of true art.

"The heart and intellect of a true Artist steal mysteriously into his lines and colours; they, too, are partakers in 'the Soul, or whatever it is, without which the material frame is inanimate and inexpressive.'

"It is on these simple conditions that vitality in art rests: they dispense at once with all the wise trifling and jargon of the schools, and leave us alone with Truth, in her sweet serious simplicity. Let the aim and the work be true: why should philosophers inquire further?—in proportion to the degree of these things, those who look receive noble pleasure. It is by such easy tests that we are to judge. The highest aim will be that which joins nobleness of subject,—involving 'wide interests and profound passions,' with the fullest statement of fact and the greatest amount of beauty, and expressing all in the most imaginative manner. Thus in the best picture we find always most of the painter's own Soul; and such work bears with it also another un-failing sign in its thoughtfulness and refinement of Execution. 'The first universal characteristic of all great Art is Tenderness,' remarks one to whom the writer and many of his readers are deeply indebted: 'an infinitude of tenderness is the chief gift of all the truly great men.'† But men's capacities differ: to one is given force of Imagina-

tion, to another simple earnestness of statement, to another, perhaps, humorous observation, to a fourth the passion and poetry of common life. The test of all styles is, however, the same,—Sincerity of purpose. The higher the aim, the harder the triumph; here we must make allowance for human shortcoming, and place even imperfectly executed work, if sincere in its loftiness, above a narrower perfection. But the choice must be sincere: a weak religious picture will rank far below an honest farmyard scene, and all the good intentions and sweet feelings of men like Overbeck or Scheffer or Dobson make us only regret the want of that power and truth without which their works are a laborious mockery. It cannot be too much remembered, that nothing but a great mind can produce a great picture. The greatest Art is that which expresses the widest and truest thoughts: the utterance of the greatest soul. Such will never be common, but we may have true and wholesome work from lesser faculties. To quote the same writer again: 'The difference between great and mean art lies, not in definable methods of handling, or styles of representation, or choices of subject, but wholly in the nobleness of the end to which the effort of the painter is addressed. We cannot say that a painter is great because he paints boldly, or paints delicately; because he generalizes or particularizes; because he loves detail, or because he disdains it. He is great if, by any of these means, he has laid open noble truths, or aroused noble emotions. It does not matter whether he toil for months upon a few inches of his canvas, or cover a palace front with colour in a day, so only that it be with a solemn purpose that he has filled his heart with patience, or urged his hand to haste. And it does not matter whether he seeks for his subjects among peasants or nobles, among the heroic or the simple, in courts or in fields, so only that he behold all things with a thirst for beauty, and a hatred of meanness and vice.'

"There is no need to add much to these fine words. When the qualities enumerated come together with sincerity, we have true Art: and so clear are the signs of it, that no one who brings the open heart and child's frank acceptance can fail in the first steps towards correct judgment, however inexperienced in pictures.

"Methinks I see a quickening in his eye."

THOUGHTS, PRACTICAL AND PHILOSOPHIC.

BEAUTY.—It is exceedingly hard to fix any general characteristic of beauty, for as the ideas and sensations of several persons differ according to the habitudes of the body and the turn of the mind, so do the relations of objects to those ideas and sensations vary, whence what we call beauty results. Hence arise those different opinions of a beautiful thought, a beautiful woman, a beautiful painting, &c. The principles of beauty, according to Mr. Hogarth, are fitness, variety, uniformity, simplicity, intricacy, and quantity. Dr. Hutcheson makes uniformity amidst variety the source of beauty; and he refers our ideas of it merely to an implanted sense. M. Perrault distinguishes two kinds of beauty in architecture, which correspond with the two species of architecture; the one he calls positive and combining, such as the richness of the materials, grandeur of the structure, neatness of the workmanship, symmetry, &c.; the others he calls arbitrary, which depend on the will, and which admit of having their proportion changed without deformity. These only please by the connexion or association of their ideas with others of a different kind, which please themselves; they owe their beauty to that prepossession of the mind whereby a thing whose value we do know insinuates an esteem for others which we do not. Thus, we observe there are many things in architecture which reason and good sense would judge deformed, and which, however, custom has not only made tolerable, but even beautiful, by their being always joined with other beauties that are positive. Thus being first pleased at viewing them in company, and merely on account of their company, at length we become pleased with them alone; and thus we frequently grow fond of faults, and fall in love even with deformity. The architect's glory consists in the designment and idea of the work; his ambition should be to make the form triumph over the matter.—Wotton.

PERFECTION.—A friend called on Michael Angelo, who was finishing a statue. Some time afterwards he called again; the sculptor was still at his work. His friend, looking at the figure, exclaimed, "You have been idle since I saw you last?" "By no means," replied the sculptor; "I have retouched this part, and polished that; I have softened this feature, and brought out this muscle; I have given more expression to

* *Handbook to the Fine Art Collections in the International Exhibition.* By F. T. Palgrave. London: Macmillan and Co.

† J. Ruskin: *The Two Paths.*

this lip, and more energy to this limb." "Well, well," said his friend; "but all these are trifles." "It may be so," replied Angelo; "but recollect that trifles make perfection, and that perfection is no trifle."

POWER.—In surveying the great works of antiquity, such as the pyramids of Egypt and other ancient monuments of art, careless observers are apt to consider the works of modern times as puny and insignificant. They are under a mistake; the works of the ancients and our ancestors in many instances were either misapplications of labour and capital, or ignorance of the objects on which to employ them usefully. London has been paved for the last fifty years with granite brought from Scotland. If the stones and labour employed in that useful work had been applied in the erection of pyramids, would not those of London have been as stupendous as the Egyptian? And yet we daily tread our pavement without reflecting what a work it has been to form and keep it in repair. A calculation of the number of acres in our vast metropolis covered with pavement, and of the quantity of stone necessary for its formation and repair during the above period, would present a very curious result.

WHAT ENGLAND OWES TO DUTCH ENGINEERS.—Our first lessons in mechanical and civil engineering were principally obtained from Dutchmen, who supplied us with our first wind-mills, water-mills, and pumping-engines. Holland even sent us the necessary labourers to execute our first great works of drainage. The great level of the Fens was drained by Vermuyden, and another Dutchman, Freestone, was employed to reclaim the marsh near Wells, in Norfolk. Canvey Island, near the mouth of the Thames, was embanked by Joas Croppenburgh and his company of Dutch workmen. When a new haven was required at Yarmouth, Joas Johnson, the Dutch engineer, was employed to plan and construct the works; and when a serious breach occurred in the banks of the Witham, at Boston, Matthew Hake was sent for from Gravelines, in Flanders; and he brought with him not only the mechanics, but the manufactured iron required for the work. The art of bridge-building had sunk so low in England about the middle of the last century, that we were under the necessity of employing the Swiss engineer, Labeyle, to build Westminster Bridge. In short, we depended for our engineering, even more than we did for our pictures and our music, upon foreigners.

THE ORIGIN OF ST. PETER'S.—Pope Julius II. was as distinguished for his encouragement of talent, as for impetuosity and unbounded ambition in the exercise of sovereign power. It was a favourite saying of his, "that learning elevated the lowest orders of society, stamped the highest value on nobility, and was the most splendid gem in the diadem of sovereignty." He was no sooner seated in the papal chair, than he took care to be surrounded by men of genius, and Michael Angelo was among the first whom he invited; and at the same time he sent him an order for a hundred ducats to pay his expenses to Rome. After his arrival, some time elapsed before any subject could be determined upon for the exercise of his abilities; at length the Pope gave him an unlimited commission to make a mausoleum, in which their future fame might be combined. Having received the commission, Michael Angelo commenced a design worthy of himself and of his patron. The plan was a parallelogram, and the superstructure was to consist of forty statues, many of which were to be colossal, and interspersed with ornamental figures and bronze basso-relievos, besides the necessary architecture, with appropriate decorations to unite the composition into one stupendous whole. When this magnificent design was completed, it met with the Pope's entire approbation, and Michael Angelo was desired to go into St. Peter's, to see where it could be conveniently placed at the west end of the church. Nicholas V., half a century before, began to erect a new tribune, but the plan had not been continued by his successors: this situation Michael Angelo thought the most appropriate, and recommended it to the consideration of his Holiness. The Pope inquired what expense would be necessary to complete it; to which Michael Angelo answered, "A hundred thousand crowns." Julius replied, "It may be twice that sum," and immediately gave orders to Giuliano de San Gallo to consider of the best means to execute the work. San Gallo, impressed with the grandeur of Michael Angelo's design, suggested to the Pope, that such a monument ought to have a chapel built on purpose for it, to correspond to its importance, and that every part of the composition might be exhibited to the greatest advantage; at the same time he remarked that St. Peter's was an old church, not at all adapted for so superb a mausoleum, and any alteration would only serve to destroy the character of the building. The Pope listened to these observations, and ordered several architects to make designs, to put him in possession of all that could be done under

existing circumstances; but in considering and reconsidering the subject, he passed from one improvement to another, till at length he determined to rebuild St. Peter's itself; and this is the origin of that edifice, which took 150 years to complete, and is now the grandest display of architectural splendour of which modern religious worship can boast.

PATENTS CONNECTED WITH BUILDING.

IMPROVEMENTS IN SCREW-WRENCHES.—W. T. Weston. Dated 17th October, 1861.—This consists in forming on either side of the handle of a screw-wrench, containing one fixed jaw or chop thereof, a toothed rack, the situation of which is at that part of the handle of the wrench along which the movable jaw or chop is to slide; and in furnishing such movable jaw with an eccentric thread or helical worm, formed on a disc or button having a milled edge; the disc being perforated with holes similar to a windlass or capstan, and placed with its pivot perpendicularly with regard to the rack into which it works; so that, by turning such screw or thread by means of its milled edge, or by the application of a lever, to the holes, the movable jaw is caused to move along the rack as may be desired with respect to the fixed jaw of the wrench.

IMPROVEMENTS IN STEAM-HAMMERS.—T. Fearnley. Dated 19th October, 1861.—The patentee forms the steam cylinder annular, in order that the ram may pass through the inner or central part of such cylinder, and thereby have increased guiding surface in its motion, as also to reduce the height of it; and he forms the piston annular with rods passing through the head of the cylinder to a cross-head affixed to or formed upon the ram, or through the bottom of the cylinder direct to the hammer above the head. He also forms the hammer to surround the cylinder; the piston-rod being keyed into the hammer just above the head. In this case the cylinder is fixed to the upper part of the framing, and the framing below is bored, to receive and guide the hammer in its motion; whilst the inside of the hammer is bored true to slide on the cylinder. He also gives motion to the valves of steam-hammers by means of a spiral groove or feather, cut or formed in the hammer, acting upon a pin or stud in connexion with the valve or valves.

IMPROVEMENTS IN LIFTING OR HOISTING APPARATUS.—J. Lister and D. Myers. Dated 16th October, 1861.—These improvements in apparatus for arresting the fall of the cage or basket in a mine, relate, first, to a combination of parts connecting the rope or chain with the article to be lifted. 2. To means for preventing the overwinding of the rope, whereby accidents often occur from the cage being pulled over the top pulley. The details of the invention are voluminous.

IMPROVEMENTS IN THE APPARATUS FOR AND METHOD OF INCREASING THE ILLUMINATING POWER OF GAS.—W. Smith. (A communication.) Dated 17th October, 1861.—This invention consists in the use of a box containing capillary arrangements or apparatus, as described, for producing an atmosphere of benzene vapour for the purpose of charging the gas passed therethrough, as set forth. Also, in the use or employment of the capillary arrangement or apparatus described, whether benzene or any other liquid carbon be employed, for the same or similar purposes.

AN IMPROVED SPRING AND FASTENING, APPLICABLE TO GATES, DOORS, &c.—W. T. Weston. Dated 4th November, 1861.—This invention consists in the application of a fastening to a straight rod or bar of hardened and tempered steel, thereby to twist or turn it so as to form a spiral, in order that, in the continual effort to regain its natural position, it may exert an action or force analogous to that exercised by springs of some other different constructions.

IMPROVEMENTS IN MACHINERY FOR ENAMELLING MOULDED SURFACES.—J. H. Johnson. (A communication.) Dated 29th October, 1861.—This invention relates to a peculiar construction and arrangement of machinery or apparatus for applying enamel to the surface of wood mouldings in the process of preparing them for gilding, as well as for the purpose of making an enamelled surface upon all material capable of being heated in this manner. The essential features of this invention consist in the employment of a plate, the lower edge of which is formed or shaped the reverse of the transverse form of the moulding to which it is applied, when such plate is made self-acting to the surface of the moulding whilst being traversed longitudinally over it. Also in the employment of a hopper, or other suitable receptacle to contain the enamelling composition, having the lower edges

of the two end plates thereof formed or shaped the reverse of the transverse form of the moulding to be enamelled, such moulding constituting at the same time the bottom of the hopper or receptacle.

IMPROVEMENTS IN MACHINERY OR APPARATUS FOR MAKING PIPES AND OTHER ARTICLES OF EARTHENWARE, AND IN THE FORM OF PIPES FOR GAS, SEWAGE, AND OTHER PURPOSES.—T. Spencer and T. Robinson. (Partly a communication.) Dated 2nd November, 1861.—This invention refers to those machines in which the direct action of steam or other fluid is employed for forcing the plastic material through or into dies, and consists in the employment of an additional power, whereby the patentees are enabled to maintain the pressure after the moulding has been effected, and to work with a less pressure of the fluid. Another part of the invention relates to making articles of earthenware by a plunger, which is forced into a mould, and consists—1, in covering the said plunger or mould with cloth or other such material, which may be peeled off; and, 2, in giving the said plunger a roughened surface. Another part of the invention relates to making pipes or other articles with a socket or other design at each end. Another part relates to a particular form of pipe for gas and sewage; which pipes they make with an enlarged part at one end, within which there is a recess, and the other end with a part capable of fitting into a similar recess upon another pipe; and they prefer so forming the ends that the interior diameter shall not be interrupted with projections.

CERTAIN IMPROVEMENTS IN STEAM-HAMMERS, AND IN VALVES APPLICABLE TO THE SAME AND TO OTHER STEAM-ENGINES.—R. Wilson. Dated 5th November, 1861.—This consists in an improved arrangement of valves and gearing for working steam-hammers, by which the steam may be admitted both below and above the piston to which the hammer block or ram is connected, or only to the former when required. The improvements in valves for steam-hammers and other steam-engines consist in so constructing them that their area and, consequently, the weight and power required for working them, are greatly reduced.

IMPROVEMENTS APPLICABLE TO BUILDINGS, IN ORDER TO FACILITATE THE EXTINGUISHING OF ANY CONFLAGRATION WHICH MAY HAPPEN THEREIN.—W. P. Bayliss, the Lloyd's, Madeley, Shropshire. Dated 20th November, 1861.—This invention consists in constructing buildings with each apartment or compartment with an aperture or apertures at the upper part, the said apertures being in (or communicating with) tubes or channels opening into the nearest chimney or flue; or the tubes or channels may be continued and opened into the external atmosphere. Hence, if a conflagration should take place, it will only be necessary to close the apartment or compartment, and the smoke and fire will find vent by the said channels, flues, or tubes. Also, for the purposes aforesaid, the patentee provides a cistern or receptacle at the upper part of the building, from which pipes descend which reach from the said cistern to the basement of the building, and may form supporting columns or pillars to it. The tops of the said pipes, where they open to the cistern, have proper valves; and from these pipes, at every floor of the building, other pipes or channels branch out in such manner that valves may be applied to stop the first-mentioned pipes at the level, or nearly so of such branching pipes; causing such flow of water from the cistern to run into the said branching pipes or channels; and thence, through suitable apertures, into the apartment or compartment, or any two immediately adjoining or contiguous apartments or compartments; and this without allowing the entry of the water into any other apartment or compartment. The floors and roofs should be fireproof.

HARDENING STONE, &c.—J. B. Hulard and L. G. Poupel, Paris. Dated 25th November, 1861.—The composition which the patentees prefer for their indurating liquid contains the following ingredients in certain proportions:—Borax, white lead, sulphate of alumina, acetate of lead, sulphate of zinc, silicate of soda or of potash, kaolin, linseed oil, and water.

GENERAL INTELLIGENCE.

CURIOUS ROMAN INSCRIPTIONS ON MOUNT LEBANON.—M. Ernest Renan, in his third report to the Emperor of the results of his mission to Phœnicia, gives the following account of certain inscriptions found in the most inaccessible parts of Mount Lebanon:—"The region of the Upper Lebanon between Sannin and the Cedar defile, as well as the middle region from Toulā to Semar-Gebeil, presents one of the most singular epigraphic problems, which has remained hitherto quite unnoticed. I had constantly heard talk last winter, at Amschit, of

innumerable inscriptions engraved on the rocks in the upper part of the mountain. I thought at first there was some mistake. It was, however, quite true. Throughout the whole of the above-mentioned region, but above all in the cantons of Akoura, Kartaba, and Tannourin, you meet at every step almost with the same inscription, repeated hundreds of times, in characters of thirty or forty centimetres in length, deeply graven in the rocks. The fundamental parts of this inscription are the following words, shortly and with contractions, *IMPerator HADrianus AUGustus*. Then comes a series of letters which vary, and of which the commonest form is *AGIVCP*. These letters remained an enigma, until I discovered in the region of Toulā four examples of the *scriptio plena* corresponding to the initials *AGIVCP*. In these four places, not far from the ordinary formula *IMPHADAUG*, you read in enormous letters upon the rocks—*ARBORUM GENERA IV CETERA PRIVATA*. This was then, doubtless, a regulation posted up in some way by order of Adrian in this region of the Lebanon, once covered with trees, and by which a division was made between timber reserved for the State and that which was allowed to be felled by private people. It must be confessed that the places where these inscriptions are sometimes found go a little against this hypothesis. Not only are the localities most often rugged, and now completely bare, but in some instances it seems as if pleasure had been taken in inscribing these notices in strange picturesque places, or where the difficulties and dangers of the approach seemed to speak a sort of defiance: as in the accessible summits of the Djebel-Moussa, the wildest points of Lebanon; on the highest summits between Akoura and Cœlesyria, where the snow remains till the month of June, and where only creeping shrubs grow; amongst the rocks above Tardedj and Tannourin, where one might think that man had never penetrated; in the grotto of Ayyoub, hollowed in the side of a pointed rock, which you can only reach by the help of shrubs hanging over the river Adonis. Could our inscriptions be in some cases mere *caries de visite* of the Imperial traveller, like that of the same Emperor which we read on the colossus of Memnon in Egypt? The long stays which Adrian, both before and after his elevation to the empire, made in Syria are well known. It is known also with what curiosity he visited celebrated shrines; doubtless he would make a point of performing a pilgrimage to Aphaca. However this may be, I have found nearly one hundred of these curious inscriptions; a considerable number more may have escaped me, and a much greater number must have been destroyed, or thrown face downwards. These inscriptions are, in fact, considered as marking deposits of treasure, and nearly all are, more or less, fractured."—*Parthenon*.

SHAKESPEARE'S HOUSE.—INTERESTING DISCOVERY.—Unexpected discoveries of a very interesting character have been made in excavating the site of Shakespeare's New Place. Not only have the entire foundations of the house, as altered by Sir Hugh Clopton early in the last century, come to light, but portions of the basement of Shakespeare's own residence towards the east and south have been discovered, the latter intersecting the more recent design. It seems that Shakespeare's house extended a few feet into the present Chapel-lane, at the corner opposite the Guild Chapel, its frontage in Chapel-street being about fifty-four feet, taking in a small part of what was lately Dr. Rice's residence. When Sir Hugh Clopton rebuilt New Place, he diminished it a little on the north side, the adjoining house thus gaining a small space, in the inside of which, as was discovered by Mr. E. Gibbs, still remain distinct traces of the gable end of the old New Place. We can thus attain a pretty tolerable idea of the dimensions and form of the poet's last residence. More interesting still, in the opinion of many, will be Shakespeare's original well, which has been discovered, with its ancient stone quoining at the back of the site of the house.—*Athenæum*.

TASMANIAN STONE.—This building stone has been extensively used in the construction of the public edifices in Tasmania and other colonies. J. E. Calder, Esq., one of the Commissioners appointed to collect the products of Tasmania, has obtained a very valuable collection from numerous quarries; yet so abundant is this material that this collection represents only a portion of the quarries now in work there. A church font, worked in stone from Point Ventenat, illustrates in a striking manner the adaptability of this stone to this and other purposes to which it had not previously been applied. Amongst these latter may be mentioned some grindstones which are exhibited, of great size and fine quality; and also other smaller ones, said to be eminently suitable for glass-cutting. Some of the marbles which have hitherto been used only for the making of lime, and which cover a considerable portion of Tasmania, have been discovered, when

properly polished, to be eminently beautiful, and suitable for internal decoration.

THE CRYSTAL PALACE IN A NIGHT STORM.—Last Wednesday evening, says the *South Eastern Gazette*, we had an opportunity of being inside the Crystal Palace during the violent thunderstorm that visited the neighbourhood of Sydenham. The novelty of the sights that presented themselves was striking and marvellous. In a moment, from intense darkness, the whole building was lit up—every object standing out as bright as in day in all the distinctness of the stereoscope, to which indeed it might be compared, with the additional association of grandeur in its fullest extent. At another time the western end of the centre transept assumed the character of a brilliant luminous mass, with a vividness that lightning only possesses—brighter far than the sun. Then, again, the roofs were illuminated, all their beautiful proportions exhibited, and their outlines distinct and dazzling, as though studded with millions of diamonds. Turning to the southern side we looked out upon the expanse that lay before us; here the scene was magic in its character. From intense darkness, flitted, at rapid intervals, every object, statue, fountain, tree, shrub, terrace, and the distant country to Sevenoaks, in brilliancy that can scarcely be described by language. We never before witnessed anything so peculiarly beautiful and grand.

WOODEN CHURCHES.—*Notes and Queries* says:—Although the interesting church of Little Greenstead, in Essex, is chiefly composed of upright wooden blocks laid close together, yet it has (or had) brick buttresses and a brick chancel. Newland Church, Worcestershire, two miles from Malvern, on the Worcester-road, is one of the few wooden-framed churches remaining in the country. The panelling between the frame-work is lath and plaster, but here and there repaired with brick. The little church is supposed to have been a grange belonging to the Priory of Great Malvern, and resembles many of the half-timbered houses in that neighbourhood—that at Pickersleigh, for example. There is a wooden porch, a wooden bell-cot, and two-light windows with wooden frames. It is supposed to have been erected in the fifteenth century. (See Noakes's "Rambles in Worcestershire," iii. 7.) The font, however, is early Norman, and is thought to have been brought from Malvern Abbey church.

DOMESTIC ARCHITECTURE IN SINGAPORE.—Within his own house, Whampoa lives entirely in the European fashion. One of his properties, which is several miles in circumference, has a spacious, elegantly-furnished mansion, with a splendid colonnade, a beautiful flower-garden, and a perfect menagerie of useful domestic animals. Within the house all the arrangements are European, with the exception of the oval doors, communicating between the great saloon and the ante-chambers, which are pushed into the wall on either side, and have a very surprising effect. In the evening, especially when the saloon is illuminated, if a person passes through this oval entrance, the effect is as of a life-size portrait set in a golden frame. It would not be a bad idea to introduce this Chinese form of doorway into our European residences and country seats; and it is assuredly not the only improvement in the decorative art which we could borrow with advantage from the Chinese. Whampoa's own favourite habitation is about four miles outside the town, and presents a curious admixture of European comfort and taste with Chinese notions of ornament. In the saloons, adorned with a quantity of neat fancy ornaments, are suspended from the walls verses and proverbs of the most renowned Chinese poets, all written on long, elegantly-illustrated rolls of paper.—*Parthenon*.

A LONG-CLOSED THEATRE REOPENED.—At the moment of the destruction of Pompeii by an eruption of Mount Vesuvius, A.D. 79, a theatrical representation was being given in the Amphitheatre. A speculator, named Langini, taking advantage of that historical reminiscence, has just constructed a theatre on the ruins of Pompeii; and the opening of which new theatre he announces in the following terms:—"After a lapse of 1800 years, the theatre of the city will be reopened with 'La Figlia del Reggimento.' I solicit from the nobility and gentry a continuance of the favour constantly bestowed on my predecessor, Marcus Quintus Martius; and beg to assure them that I shall make every effort to equal the rare qualities he displayed during his management."

M. MARIETTE'S DISCOVERIES AT TANIS.—The number of the *Revue Archéologique* for May contains an interesting account of discoveries made by M. Mariette in the mounds of San, the ancient Tanis, in December last. Among the numerous monuments discovered are two colossal figures of Amememha I., and his son Osortasen I., the first two kings of the twelfth dynasty; colossal figures of two kings of the 13th

dynasty, bearing their names, one of them previously unknown; a colossus of a king of one of the succeeding native Egyptian dynasties, bearing his name and surname, and remarkable from having the name of a well-known shepherd-king engraved upon the right shoulder, a mark of conquest or appropriation. The city of Tanis was the seat of the Shepherd dynasty, and the recent discoveries of M. Mariette have brought to light various striking memorials of their power. Four sphinxes, having a marked un-Egyptian physiognomy, had been previously found. To these is now added a group of two standing human figures bearing offerings, and having the same singular features of unmistakable foreign type. These researches have thrown a great light upon a hitherto obscure epoch of Egyptian history, and one which some antiquarians have wished to sweep away altogether as never having had existence. It is clear that the conquering Asiatic tribe adopted to some extent the arts and language of those whom they conquered,—a process of which there are many other examples in history, where a powerful but uncultivated race has overrun a feeble country possessing an advanced standard of cultivation. The same number of the *Revue* contains a continuation of the report made by M. Renan of the results of his mission to Phœnicia, and relating principally to the locality of Aradus, where the explorations have yielded most important results.

ARCHITECTURE—that art which literally comes home to every one, and of all the Fine Arts is the most directly practical—by a singular fate, is probably less a subject of popular thought and care than any other. Most persons have a certain interest in pictures: even if not much versed in painting, they contend for the right to please themselves. But when a building is in question, we hear with alacrity the reply, "*I know nothing of architecture.*" A brief sketch of the elements which compose the modern schools would at once supply the main facts of the history, and explain the causes of an indifference so fatal to the progress of the art. This story must begin far back, for in Architecture, from its essential nature and from the similarity of the wants which it provides for, practical experience has been the source of the changes generally made, and established types have always held a strong hand over free imagination. Nothing is more curious than to watch the slow steps by which men learned the simplest expedients, and the persistency of a few forms through every age between Nebuchadnezzar and the Nineteenth century. We are indebted here, as for the elements of almost all human knowledge, to ancient Greece. The Greek style was itself, indeed, founded on the earlier practice of Assyria and Egypt, but it was only by the reduction of African or Asiatic architecture to European ideas and climate in Greece, Italy, and Sicily, that it was able to influence later races. The mode by which spaces are covered is the simplest rule under which styles can be classed, as on this ultimately depends the greatest portion of those ornamental features which render Architecture a fine art, as distinguished from Building.—PALGRAVE.

NOTICE TO CORRESPONDENTS.

IN the execution of the Plates which form our Illustrations, we hope always to have the advantage of the designs of the Architects whose buildings we represent. We also invite those gentlemen, in every instance, to communicate both with our artists and ourselves during the progress of our drawings, and we shall always be anxious to secure their approval for every illustration on its completion.

The lithographs contained in the present Part have all been executed from photographs. Their accuracy may be depended on, and they will doubtless be preserved and valued as faithful pictures of an interesting public monument, and a chaste example of the street architecture of London in the Victorian age.

All communications for the Editor to be addressed to the care of DARTON AND HODGE, Publishers, Holborn-hill, E.C.

INIGO JONES AND HIS WORKS.



It has been well said that to *write* a good life is almost as difficult as to *live* one. The cause of this difficulty is twofold. First and foremost the scarcity of good biographers, and secondly, the scantiness of the material necessary to the composition of an entertaining and instructive biography. In the great ma-

majority of instances the biographer is placed in the same deplorable position as Canning's "Weary Knife-grinder"—he has "no story to tell;" or if he has, it is a thousand to one that it is of such an insipid character as to have no manner of attraction for the popular palate. Still something is expected from the unfortunate wight who undertakes the narration of the life and achievements of a distinguished man; and though he may have nothing new to tell, though all that is really worth relating be as well known to the enlightened public as to himself, the biographer is expected, under the awful penalty of an unsold edition, to communicate something both novel and interesting respecting the hero of his story. The life-writer is thus placed in the same cruel situation as the enslaved Israelites who were compelled to produce the ordained tale of bricks without the requisite straw.

Of the inner or even the domestic life of our greatest men little or nothing is known. Yet this phase of their being is that which has most value for the biographer, and most fascination for the general reader. It thus happens that in order to eke out his materials to the prescribed dimensions, and in order to tell the eager public something which it did not know before, a lot of utterly irrelevant matter—the "bald disjointed chat" of contemporary ignorance, or the tame and tasteless effusions of respectable but ponderous correspondents, have to be introduced, and fastened upon the back of the departed victim of biographical exigency.

These too obvious truths have been suggested to us by the perusal of the various extant accounts of the life and works of the celebrated English architect, Inigo Jones. Somebody has said that happy is the nation that has no history. Though seemingly paradoxical, it is equally true, that happy is the man who has no life to be written. Mankind are constantly complaining of the disappointments, sufferings, sorrows, crimes, and tragedies incident to man's earthly existence. Yet nothing is more evident than that without sorrow and suffering, and tragedy and crime, no history, novel, romance, or play that would be read, or which is more important, that would be bought and paid for, could be written. The life of a uniformly and invariably prosperous man would be intolerably insipid. Dr. Johnson, we know, became tired and disgusted with the everlasting green fields which he encountered in the country. Six months, or even six weeks' sight of nothing but the ocean—one of the most majestic objects in the material universe—is enough to give a longing for land to the most inveterate and voracious lover of salt water in existence. Even the very stars, from the unbroken regu-

larity of their movements and appearance, do not, on the minds of the masses of mankind, produce an impression commensurate with the sublimity of their presence. Hence the fine observation of Emerson: "If the stars should appear but one night in a thousand years, how would men believe and adore, and preserve for many generations the remembrance of the City of God which had been shown!" It is with the life of man as with the scenery of the material world: in order to be interesting, it must present alternations of view.

Fortunately for the biographers of Inigo Jones, that eminent British architect had both successes and misfortunes. Like every man worth commemorating, he had difficulties to surmount, battles to fight, powerful and pitiless foes to contend with. But we must not anticipate.

Inigo Jones, the subject of this brief notice, was born in the city of London, in the neighbourhood of St. Paul's Cathedral, in the year 1572. Neither the day nor the month of his birth is known; nor is there anything known of his mother or her family. His father was a citizen of London, a clothworker by trade, and a Roman Catholic by religion. He is said to have been wealthy; but of this there is some doubt. He is also said to have been a highly respectable man, and this we have no reason to doubt; for if anything could have been alleged against his character, as the sequel will show, the powerful and unscrupulous enemy who libelled and lampooned his son would in all probability have mentioned it. Of the early education of the future architect, nothing certain is known. According to some accounts, it was liberal; according to others, it was quite the reverse. That the latter is the true account, it is reasonable to believe, from the fact of his having at an early age been apprenticed to a joiner. Ben Jonson, who had himself been a bricklayer and had handled the trowel, if not carried the hod, had the meanness to reproach Jones for having in his boyish days touched the handsaw and the plane. At a very early age Inigo Jones evinced considerable ability in the arts of design and landscape painting. By his talent in these accomplishments he, it is presumed, gained the notice and the patronage of William Earl of Pembroke, whose liberality, it is reasonable to infer, helped to enable the young aspirant to artistic eminence to travel through France, Germany, and Italy, in order to study the most remarkable architectural monuments of these countries. Of young Jones's patron, this same William Earl of Pembroke, a few words may be here introduced. This true nobleman, whose patent of nobility was derived from heaven, is one of the most pleasing characters in English history. The vocabulary of eulogy has been exhausted in describing his brilliant and manifold merits. He was witty and learned, gallant and true, refined and high-minded. "He was neither subservient to Elizabeth, who was partial to him, nor to James, who stood in awe of him. He was liked by the courtiers because he asked for nothing, and admired by the public because he was indebted to the Court for nothing. He stood a superior being among the buffoons and sycophants of the Court of

James; among them, but not of them. He was loyal to his king, he loved his country, defended its institutions; he lived magnificently, without impoverishing his heir; and possessed genius himself, and distinguished it in others. In a word, he was the patron of Shakspeare and of Inigo Jones. It is now, we believe, pretty generally admitted that he was the W. H. (William Herbert) to whom the sonnets of Shakspeare were inscribed as the only begetter of them.* The only flaw in his otherwise perfect character was that he was too much the votary of pleasure, too ardent in his admiration of fair women, for whom he sacrificed too much both of his fortune and his time. At the council-table of James the Earl's conduct was manly in the extreme. He never hesitated to oppose any measure which he deemed injudicious or immoral, however much the monarch's heart might be set upon its adoption. His opposition to the proposed marriage of the Prince of Wales (afterwards Charles I.) was so fierce and determined, that the King is said to have been actually terrified at his vehemence. Nevertheless, the King had sense enough to value the fidelity and open dealing of this nobleman, though, as Lord Clarendon says, "he rather esteemed Pembroke than loved him." A curious anecdote, which is highly characteristic of the King and of the manners of those days, is related of the Earl. Pembroke is said to have entertained a singular antipathy to frogs. James, aware of this dislike, and delighting to a childish degree in any practical joke, once took an opportunity of thrusting one of these creatures down the Earl's neck. Pembroke revenged himself in a manner which would not have been ventured upon by any other nobleman about the Court. James, as is well known, had an invincible abhorrence of a pig. One of these animals was therefore procured by Pembroke's orders, and placed under the bed in the King's apartment. His majesty was excessively annoyed when the pig, in the truly piggish fashion, made its presence known; and what added to the royal displeasure, was that the joke was played in the Earl's own house at Wilton, where the King was a guest. However, James, who was no fool, knew that those who play at bowls ought to be prepared for rubbers, and he therefore deemed it prudent not to resent the affront. William Earl of Pembroke was born in 1580; he was thus eight years younger than his *protégé* Inigo Jones. He died in his fiftieth year; and it is singular that two persons (one the Earl's own tutor, Sandford, the other the mad prophetess, Lady Davies), foretold that Pembroke would either not complete or else die on the anniversary of his fiftieth year. This prediction was most remarkably fulfilled; for William Herbert, Earl of Pembroke, died on the birthday which had completed his fiftieth year. Such is a brief outline of the life of the nobleman by whose liberality Inigo is believed to have been enabled to complete his education. It is instructive to find that Philip Earl of Pembroke, the brother and successor of William, and his exact opposite in all good qualities, was the bitter enemy and calumniator of Inigo Jones.

From Italy, where he had spent some years, Jones was

invited to Denmark by Christian IV., for whom it is said he designed the royal *château* of Fredericksborg, and also the palace of Rosenberg. But this also, like almost everything else appertaining to Inigo Jones, is doubted; and it is only fair to admit that if it could be conclusively shown that he had nothing to do with the construction or design of these royal dwellings, his reputation as an architect would not have sustained the slightest injury from the circumstance. In a worldly point of view, however, there can be no doubt that the young Englishman's connexion with the "Majesty of Denmark" was highly beneficial to him. Christian IV., who was what is vulgarly but graphically termed a "jolly toper," was a good-natured fellow, and he recommended Inigo Jones to the favour of his royal sister Anne, the Queen Consort of Great Britain, and the wife of that pedantic and comical monarch James I. of England and VI. of Scotland.

Inigo Jones' principal occupation at the English Court was in devising the machinery and decorations of the masques and theatrical pageants then in vogue. In the getting-up of these fashionable amusements he was associated with Ben Jonson, to whom was entrusted the execution of the literary department of these Court entertainments. For a time the poet and the architect agreed tolerably well; but Jones being arrogant and Jonson irritable, they speedily quarrelled, and from the quarrel a bitter and life-long feud ensued. In this celebrated quarrel it is now impossible to determine who was chiefly to blame. In all probability the fault was pretty evenly divided between the two. But of one thing there can be no doubt, and that is, that "rare Ben Jonson" carried his animosity towards Jones to an unjustifiable length. The personal appearance, the intellectual attainments, the antecedents, the assumed obscurity of origin, the common forms of expression, the professional capacity, and even the very name of Inigo Jones, were all noted, depreciated, caricatured, ridiculed, and sneered at in a style and spirit of the most malignant hostility by the irritable and implacable poet. In this matter, Jonson, as is invariably the case with those who give full swing to their rage, greatly overshot his mark. His ferocious and persistent attacks upon Jones provoked a sympathy in the architect's favour, and drew a remonstrance and a rebuke from the very highest quarter. Howell, a courtier, generally believed to have been moved thereto by the King himself, wrote to Ben, saying: "I heard you censured lately at Court that you have lighted too foul upon Sir Inigo, and that you write with a porcupine's quill dipt in too much gall. Excuse me that I am so free with you—it is because I am in no common way of friendship yours." This letter having failed in effect, Howell again wrote: "If your spirit will not let you retract, yet you shall do well to repress any more copies of the satire on the royal architect; for, to deal plainly with you, you have lost some ground at Court by it; and as I hear from a good hand, the King, who hath so great a judgment in poetry as in all other things else, is not well pleased therewith. Dispense with this." This remonstrance, it is believed, had the effect of inducing Jonson to recall and destroy, as

* Jesse's "Court of England during the Reign of the Stuarts," vol. i.

he imagined, every copy of this particular satire; for at Jonson's death, which happened soon after, not a line of it was found amongst his papers. One, however, escaped, or was concealed; it was sent to the press, and thus the proof of a squabble, which raised neither the character of the poet nor of the architect, has descended to posterity.

But our architect, notwithstanding his feuds with Jonson and the severe strictures of the latter on the construction and scenic tricks of the masques, continued to furnish the Court with these inventions, and with undiminished acceptance, down to 1640. Of his employment and inventions in these amusements he seems to have been proud. He preserved all the designs of the masques in a folio volume, which came into the possession of Lord Burlington. He drew with uncommon neatness and delicacy—his hand obeyed his eye and his taste, and impressed on all he touched the stamp of elegance. In the Lansdowne manuscripts are preserved "original ground plots and profiles of scenes erected at the New Masquing House, being eight in number, by Inigo Jones."

Jones had been appointed architect to the Queen and Prince Henry; but the Prince having died in 1612, Inigo's income suffered. About this time he is supposed to have paid his second visit to Italy, where he resided, chiefly in Venice, for about a couple of years. To his second residence in this classic land is manifestly traceable the great improvement in the unity and elegance of his buildings, and his rejection of the heavy and grotesque style to which previously he was addicted.

In 1620 the King ordered him to write a work proving that the Stonehenge antiquities were the works of the Romans! Jones, whose ideas were little else but Roman, may have convinced himself of the truth of this theory, but it has not been ascertained that he was successful in making a single additional convert to this preposterous hypothesis, excepting of course the herd of servile courtiers, who, if the King had so willed it, would have taken a solemn oath that the mystic circles of Salisbury Plain were built by spiders for the weaving of their webs—not by the Druids for the celebration of their rites. About the same time at which he was engaged in the composition of this work in support of the Royal and ridiculous theory, Inigo Jones was also engaged in building the Banqueting House at Whitehall. This masterpiece of Jones was meant only as a pavilion to a magnificent palace intended to be erected, and of which we have a splendid design from Inigo's ideas. This Banqueting House still exists, and is the best evidence we have of the pure and elegant taste for which Jones was distinguished.

In the same year, 1620, he was appointed one of the Commissioners for the repair of old St. Paul's; but not until thirteen years after was the work of reparation begun. "In the restoration of that cathedral," says Walpole, "he made two faults. He first renewed the sides with very bad Gothic, and then added a Roman portico, magnificent and beautiful indeed, but which had no affinity with the ancient parts that remained, and made his own Gothic appear ten times heavier. He committed the same error at Winchester, thrusting a screen, in the

Roman or Grecian taste, into the middle of that cathedral. Jones indeed," continues Walpole, "was by no means successful when he attempted the Gothic."

In 1623 he was employed at Somerset House, where a chapel was fitted up for the Infanta of Spain, the intended bride of the Prince of Wales, afterwards Charles I. The front to the river, part only of what was designed, and the water gate, were erected afterwards according to the designs of Inigo, as was also the gate at YORK STAIRS. All these were removed to make room for the present beautiful structure known as Somerset House.

On the accession of Charles I., Jones was continued in his post under both king and queen. His fee as surveyor was 8*s.* 4*d.* a-day, with an allowance of 46*l.* a-year for house-rent, besides a clerk and incidental expenses. What other rewards he had are not upon record. During the prosperous state of the King's affairs it fared well with Jones; but he very speedily partook of the misfortunes of his Royal master. Inigo Jones was not only a Court favourite and a royalist, but also a Roman Catholic. It is therefore not surprising that, to the fanatical Puritans and republicans of the Commonwealth and the Protectorate, he should be highly obnoxious. He became a marked man, and the especial target for the malice of the small minds who know no other mode of proving their fidelity to their own party than by the misrepresentation and persecution of the most distinguished and meritorious votaries of the opposing side. The first attack made upon Inigo Jones was in 1640, when he was called before the House of Lords on a complaint of the parishioners of St. Gregory's for demolishing part of their church in order to make room for his additions to St. Paul's. In 1646 he was obliged to pay the sum of 546*l.* by way of composition as a "malignant." The death of Charles greatly affected Jones, and he died at Somerset House, worn down with grief and misfortune, in, according to some accounts, July, 1651, or according to others, in 1653.

Horace Walpole has given a catalogue of the principal buildings erected and decorated by this architect. After the Banqueting House, Walbrook Church was one of his best works. Another, which had been greatly admired, was the arcade of Covent Garden and its church; of these two structures, Walpole declares that for himself he "wants the taste to see their beauties. In the arcade there is nothing remarkable, the pilasters are as arrant and homely stripes as any plasterer would make. The barn roof over the portico of the church strikes my eyes with as little idea of dignity and beauty as it could do if it covered nothing but a barn. It must be owned that the defect is not in the architect, but in the order. Who ever saw a beautiful Tuscan building? Would the Romans have chosen that order for a temple?"

Amesbury, in Wiltshire, was designed by Jones, but executed by his pupil Webb. Jones was one of the first that observed the same diminution of pilasters as in pillars. Lindesay House, in Lincoln's-inn-fields, which he built, owes its chief grace to this singularity. In 1618 a special Commission was issued to the Lord Chancellor, the Earls of Worcester, Pembroke, Arundel, and others,

"to plant and reduce to uniformity Lincoln's-inn-fields, as it shall be drawn by way of a map or ground plot by Inigo Jones, surveyor-general of the works." This square of land was laid out so as to be of the exact dimensions of one of the pyramids. This conceit would have been in perfect keeping with the fantastic tastes of those ages when the keep of Kenilworth Castle was erected in the form of a horse fetter, and the royal palace of the Escorial in the shape of St. Laurence's Gridiron.

Coleshill, in Berkshire, the seat of Sir Mathew Pleydell, built in 1650, and Cobham Hall, were Jones's. He was employed to rebuild Castle Ashby, and finished one front, but the civil war interrupted his progress there, as it did also at Stoke Park, in Northamptonshire. Shaftesbury House, now the London Lying-in-Hospital, has a beautiful front by Jones. The Grange, in Hampshire, is entirely by this master. The great gate of Beaufort Garden, Chelsea, designed by Jones, was purchased by Lord Burlington, and by him transferred to Chiswick. He drew a plan for a palace at Newmarket, but not the wretched one that stands there at present. One of the most beautiful of his works is the Queen's House, at Greenwich. The first idea of the hospital is said to have been taken from his papers by his pupil Webb. More buildings in England might have been added, but some are doubtful, some have disappeared, and others merit no particular notice. In Scotland, Heriot's Hospital, Edinburgh, Glamir Castle, in Forfarshire, and Drumlanrig House, Nithsdale, are said to be by Inigo Jones, but none of these are included in the collection of designs published by Kent or Ware.

Inigo Jones may be regarded as the representative and accomplisher of the transition from the Tudor, to that classical style of architecture which culminated in Sir Christopher Wren. As a Gothic architect he was simply detestable. "King James's Gothic, and Inigo's designs of that period," observes Walpole, "are not Gothic, but have a littleness of parts and a weight of ornaments, with which the revival of the Grecian taste was encumbered, and which he shook off in his grander designs."

Jones was a profound admirer of Palladio, the celebrated Venetian architect. He was himself called the English Palladio. A copy of this artist's "Architecture," with manuscript notes by Jones, is in the library of Worcester College, Oxford.

Of the personal appearance of Inigo Jones not much is known, and still less is known of his domestic manners. The portraits by Vandyke, the finest that have proceeded from the pencil of that artist, are almost all that we have to give us an idea of the "outer man" of this distinguished architect. That he was fond of distinction, and even vain of the countenance of the Court and the notice of the great, there is reason to believe; but this is a weakness which he shared in common with some of the most eminent men that ever lived. He was also remarkable for stateliness of demeanour, splendour of dress, and a free and generous mode of living. His doublet of velvet and his embroidered cap became him well; neither do we see much to censure in the airs which

he affected in the management of the masques, so well described by Jonson. "Rare Ben," also, in one of his attacks, reproaches Jones with having a narrow forehead, and just as we learn from Sir John Falstaff's indignant denunciation of Master Dumbleton the haberdasher, who would not take the security of poor Bardolph for the price of the satin necessary to make the fat knight a short cloak, that "yea, forsooth," was a common mode of expression with the London tradesmen of three hundred years ago, we in the same manner learn from Ben Jonson's bitter attacks upon Inigo Jones that "feasible" and "conduce" were among the commonest words used by that architect.

"He'll do't alone, sir, in-and-in,
Draws with no other in's project, he will tell you.
It cannot else be '*feasible*' or '*conduce*.'
Those are his ruling words."

That Jones endeavoured to meet the difference of our climate and the demands of modern society is sufficiently visible in the works which are still in existence, and much more so in the designs which he left on paper. In number these amount to some six or eight and twenty, and in them the genius and knowledge of the artist unite in full strength, and exhibit the elevations and details of all sorts and manners of dwellings, from a farm-house to a palace. That he was a stout-hearted and courageous man, we know from the fortitude and dignity with which he sustained the cruel persecutions to which he was exposed by the bigoted Puritans and servile Parliament of the Commonwealth times. He lived to be well nigh eighty years of age, and was the contemporary, to a great extent the companion, of Shakspeare, Bacon, Jonson, Raleigh, Milton, and other stars of the first magnitude, now forming the most brilliant constellation of lights in the firmament of intellect.

THE PROPOSED MONUMENT TO THE MEMORY OF HIS ROYAL HIGHNESS THE PRINCE CONSORT.

WE have one consolation to suggest in the issue of the deliberations of the Committee appointed by Her Majesty to select a monument to the memory of her departed husband—it may indeed be but a poor one, yet we may be thankful even for this—namely, that it occasions no disappointment. No expectations could have been entertained by any reasonable person in this case of a deviation from the universal rule of failure in the attempt to discover an appropriate monumental memorial for England's illustrious dead. This is abundantly manifest from the progress and result of the subscription, which is so far from being an expression of the national feeling, that after the most strenuous efforts, after a wide distribution of begging-letters conceived in the worst taste, the total amount realized is but a small and comparatively insignificant fund. If we analyse the subscription list so pompously and repeatedly advertised, we find the bulk of the fund subscribed by *employés* or expectants of office, who could not decently withhold their contributions; by persons who evidently seek and obtain their reward in

the notoriety of newspaper columns; or sycophants who aim at commending themselves to the favourable notice of the Queen or her family. Had it been otherwise, had the public reposed any confidence in the Committee, or any hope of a favourable result, it is obvious that a very large sum indeed would have been subscribed. Perhaps no sentiment ever in this, or any preceding age so universally pervaded a nation as the grief for the premature loss of the Consort of Queen Victoria. The hearts of every one of her subjects pulsed in unison, every class, every family, every individual sympathized with their revered Queen. The Prince Consort was endeared to Englishmen all over the world by qualities most readily understood and most highly appreciated by us, and, moreover, susceptible of being characterized intelligibly in a few words:—A MAN OF THE MOST EXALTED RANK, WHO NEVER FAILED IN HIS DEVOTION TO AND PERFORMANCE OF HIS DUTY. And although not unfortunately indispensable as an accompaniment to win public esteem, yet still greatly enhancing his value in the minds of the better sort of Englishmen, the Prince had led the most exemplary social, moral, and religious life. Under such circumstances, at a time of profound peace, in the enjoyment of the most prodigious and unparalleled wealth, it might have been supposed that a spontaneous offering would have been made sufficient to produce the greatest work of art in the world. There was no lack of desire to do the departed favourite of the nation this honour, a desire which finds expression in numberless local subscriptions for statues or institutions, and only withholds support from the proposed great metropolitan monument. We have not far to look for the reasons of this; they are obvious enough. In every open space in and around the metropolis stand statues and monuments so hideous and inappropriate, as to make every spectator possessed of a grain of taste avert his eyes with a shudder of disgust. They are the works of committees unqualified for the task they assumed. What hope could be entertained of a new committee? what expectation that a design should be selected and the funds applied in any sort to afford satisfaction? If any one should question the judgment or common sense of the British public, here is the answer. They have not in this instance been imposed upon! No one can deny the talent and estimable character of the individuals composing this committee. It was their corporate character which foreshadowed and ensured their failure. The fitness of such a committee for the work entrusted to it we deny—the public by its unmistakeable reticence emphatically denies. The Report they have issued amply justifies the general apprehension. First they are engaged in the hopeless extravagance of rivalling the obelisks of Egypt by finding a huge monolith. This brilliant idea, suggested by the *Times* newspaper in bitter irony, to insinuate an utter privation of a sense of beauty, power of invention, originality, and every æsthetic element in the country, was adopted as if it were something grand and noble, and only abandoned on the miserable plea of its costliness, not its inherent absurdity. Next, they enter on the trackless ocean of discussion, and their

problem seems to have been to reconcile the incongruous crotchets of the several members. We may realize and hear the opinions expressed in the resulting report. If a commission had been entrusted to Sir Charles Eastlake to erect a monument or paint a picture, we should have had no fear of the results; if to an architect of skill, thought, and judgment, we might have been safe; if to one of many British sculptors, a tolerable statue might have issued. The incompatible tastes and jarring opinions of men meeting round a committee board have ever been, perhaps ever will be, a sure presage and efficient cause of failure.

In the conclusion actually arrived at, there is however in this case something worse than failure. The Committee have not only palpably broken faith with the public in general and the subscribers in particular, but they have blunderingly made it appear that our gracious Queen has been a party to this breach of faith. In the letter appointing the Committee, written in the name of the Queen, it was distinctly stated that the subscriptions were asked, not for an institution, or building, but for a monument to be placed on the site of the Great International Exhibition of 1851, noble and striking by its magnitude, and adorned with sculptures to commemorate the incidents of the Prince's life. Such was the expressed wish and command of Her Majesty. And how has this been regarded? The wish itself was said to be in conformity with the ideas often expressed by the Prince in his lifetime. It evidenced at once good taste and correct judgment. No spot in, or near the Metropolis is so suited for the site of a monumental memorial. Seen from the Parks, in a space allowing for a concourse of any number of spectators, meeting the eyes of thousands who daily resort there for recreation, a noble and majestic pile situated there would have effected all the purposes of such a testimonial of national respect. Whether the form were that of an obelisk, or a pyramid, it would have been at once appropriate and enduring. The former was the form spoken of, and apart from the vulgar crotchet of making it consist of a single stone, it might have been "adorned with sculptures," making the memory of the life and actions of the Prince coeval with the existence of the nation. Instead of this, we are to have the most inappropriate and bald production which the wit of man can conceive—a hall for the meetings of scientific men in one place, a statue in another! Why a hall for such a purpose? Was the departed Prince merely a man of science? Was he not also a patron of painting, of agriculture, of literature, of schemes of benevolence? Was he not also a statesman? Do men of science need a shelter for their heads, a place of meeting? And if they do need a hall to meet in, why employ the funds raised under the pretence of erecting a monument to such a purpose? The press has unanimously declared against this weak and foolish scheme. We do not agree with our contemporaries in believing that it is a job. We give credit to the Committee for better feelings than to make a job out of the solemn duty entrusted to them. But we should like to hear the answer that can be given to the remark, that near the spot where it is proposed to erect this "hall,"

numberless halls will in a few months be available for the purpose, when the Exhibition building is evacuated.

We cannot afford space to repeat, or even to enumerate, all the objections which have been urged against this project; it must suffice to say, they seem to us to be insuperable and unanswerable. We sincerely trust the good sense and justice of Her Majesty will yet interfere to prevent the perpetration of this sad blunder, and to keep faith with the subscribers to the fund. We believe that were this done, and a judicious plan enunciated, any amount of money required would be forthcoming.

An apologist for the Committee has thrown out an ingenious suggestion—namely, that the proposed building will be made to conceal a very unsightly portion of the Exhibition building. This very praiseworthy object might be advantageously extended over many parts of London. If erections successfully shutting out from public view all the ugly projections of public buildings, monuments, &c., were made to connect themselves with the memory of the Prince, there would be little fear of his ever being forgotten. We do not recommend this, but it is the only tenable argument for the building of a central hall of science.

Perhaps the public mind rather inclines to some noble institution for a benevolent purpose as the fittest memorial of the Prince. There is much to be said in favour of such a project. It would, however, be difficult to select one from the vast number of objects having claims to be chosen. A mere wing, or new ward to a hospital, a mere complimentary, or supplemental addition to any asylum, school, or college would, we think, be quite inadequate when a national sentiment has to be embodied. Such a commemorative offering befits a private person or less exalted public character, not one so honoured as the Prince Consort. If anything, it must be a substantive institution of magnitude. Funds would not be found wanting were such a design entertained. But upon the whole we consider Her Majesty's own suggestion by far the best; and we would add that no better method of realizing it has met our eye than one described in a small anonymous pamphlet, published by Messrs. Darton and Hodge, of Holborn Hill, and briefly noticed in the second number of this Journal.

ON THE RECENTLY-ERECTED BRIDGES OF WESTERN EUROPE.

BY S. J. BURNELL, ESQ.

THE sudden development of the railway system subsequent to the year 1830 has tended, perhaps more than any other circumstance, to confirm the separation of the artistical, and of the scientific, branches of the architectural profession; or, in other words, to establish the recent distinction between the pursuits of the architect, and of the civil engineer. At the same time it is to be observed that the requirements of this new mode of locomotion have so stimulated the energies of the men employed to apply it, that new materials have been introduced, and old ones

employed in manners so new, that the artistic effect of the constructions required has been strangely modified in every instance wherein the character of the building materials employed has been allowed to produce its natural effect. It is possible that to some extent the very ignorance of the civil engineers of all traditions of art-teaching may have saved them from the influence of conventionalisms, and thus have removed from them the temptation to imitate in iron forms of art adapted exclusively to stone or wood. At any rate, there has been a very marked change of late years in the "style" of bridge-building; and in those cases wherein the mode of construction adopted has compelled engineers to resort to the materials placed at their disposal by modern science, they have forcedly given to the structures themselves forms and outlines which cannot be brought under the ordinary rules of architectural design. The species of originality thus displayed has not, unfortunately, been accompanied by any knowledge of the laws of proportion, harmony, or perspective; optical effects do not seem to have been taken into account, and elegance of form has been treated rather as a thing to be avoided than as a quality to be desired. In fact, the great social revolution produced by the railway system has hitherto only thrown the previously-received canons of taste into disfavour, without eliminating any æsthetical theory of its own; and, in the practice of bridge-building especially, the deficiency of our engineers of everything like a feeling for ideal beauty is painfully apparent, to the educated observer at least.

In the early days of the railway epoch, it is true that some of the traditions of other times still lingered; and the works of Mr. R. Stephenson, on the Birmingham; of Mr. Locke, on the Grand Junction; of Mr. Rastrick, on the Brighton, lines; or those of Mr. Buck and Mr. Woodhouse on some of the Midland Counties lines; may be cited as illustrations of the application of the principles of design adopted by the earlier masters of the art. Thus the Stockport Viaduct, the Mersey Viaduct, the Ouse Viaduct, the Fairfield Street Bridge, the Ouse Bridge, &c., are solid, and at the same time elegant structures, only liable to the reproach of not presenting any study of the laws of perspective in the "batter" of the piers of the more lofty structures. The engineers thus named were also remarkably successful in their applications of cast-iron to bridges, and the manner in which that material was handled in the viaduct over the Regent's Canal at Camden Town, in the Trent Bridge, and in the Fairfield Street Bridge, may be especially referred to as worthy of study by the artist. Mr. Brunel, however, on the Great Western Railway, seems to have attempted the attainment of a strictly engineering style, and he thus inaugurated the decline of artistic bridge-building. The viaduct over the Thames at Maidenhead is perhaps a triumphant illustration of the adhesive powers of Roman cement; but the effect of the very flat ellipses, executed in such materials as ordinary brickwork in cement, is far from satisfactory; and the petty attempts to introduce in this bridge architectural ornamental details have been singularly unfortunate. Messrs. Stephenson, Locke, Buck, had the good taste

to perceive that railway structures were in themselves singularly devoid of romantic character, and that therefore they were by no means adapted to being treated on the principles of mediævalism; but Mr. Brunel either did not appreciate the essential principles of that style, or he was unable to resist the influence of the fashion of the day. It was, indeed, upon the Great Western line that Engineers' Gothic first made its appearance in railway works, and it would be hard to imagine anything more ludicrously absurd than the bridges in which Mr. Brunel endeavoured to introduce this peculiar phase of the history of architecture. Some of the bridges on the Great Western Railway, in Bath and Bristol, may be referred to as illustrations of the offences against taste committed at the outset of his career by that undoubtedly superior man Mr. Brunel, whose wonderful talent in fact only served to enable him to do the more fatal mischief to the cause of art. As specimens of Gothic architecture, they are simply detestable; as specimens of logical construction, they are equally objectionable; because the pointed arch is precisely the one the least fitted to support the efforts of heavy loads travelling at great velocities; on both scores the "narrow gauge" engineers were therefore justified in their preference for the forms more nearly allied to those of classical art; and it is perhaps worthy of more than a passing remark that the engineers who, about the middle of the decade between 1830 and 1840, represented the cause of common sense in the furious "battle of the gauges" then waged, were thus equally the representatives of regular art in matters of construction.

It was not until several years after the introduction of the railway system that any great necessity was felt for the application of materials adapted to receive new forms, or able to produce extraordinary results; and, indeed, it was not until about the year 1840 that railway bridge-building began to assume a preponderating influence over the ordinary descriptions of work of that class. Some of Telford's latest works upon the Birmingham Canal, some of Mr. Leather's bridges in Yorkshire, the various road bridges by the brothers Rennie, Rastrick, Walker, Mylne, Tierney, Clark, &c., erected between 1830 and 1840, display quite as much boldness and skill as the bridges erected upon the earlier railways; but neither in England nor on the Continent were any attempts made to alter the modes of artistic treatment previously adopted, or to overcome physical difficulties by new methods of construction, if we except the general application of the suspension principle to ordinary road-bridges. For some reasons of economy the Continental engineers seem at this time to have accorded a marked preference to iron wire suspension bridges over chain ones, and the structures of Culsac, Fribourg, Geneva, Bry-sur-Marne, Triel, la Roche Bernard, and the countless bridges over the Saone, Rhône, Seine, &c., erected about the period referred to, are good illustrations of the taste which then prevailed in this branch of art. The *Ingénieurs des Ponts et Chaussées* erected about the same time some rather remarkable timber-bridges, of which Emery's bridge over the Seine at Grenelle is a good illustration; and Colonel Emy published a description of

his method of forming timber arches of large span by means of thin planks bent on the flat (to use a workman's phrase), a system subsequently applied on a large scale to railway works by our own engineers, Locke, Green, Errington, Jee, &c. Railroads on the Continent were not rapidly adopted; and in France especially the Government engineers in the beginning opposed their introduction in the most systematic manner. It was, indeed, only in Belgium that the new method of intercommunication was at first heartily accepted, and it cannot therefore be a matter of surprise that the only works on the Continent erected in the early days of railway travelling worthy of notice should have been confined to the Viaducts of the Val Fleury and of Dolhain, and to the beautiful Bridge of le Val Benoit. In Germany, Spain, and Italy the use of railways spread even more slowly than it did in France; and indeed the state of political and social disturbance of those countries, following the events of 1830, greatly retarded their advance in the arts of material civilization. There was a lull in the revolutionary storm about 1840, and the various governments of the Continent seemed for a time to be relieved from the necessity of struggling for their existence; they then began to turn their attention to the mighty social revolution which was being effected in England, America, and Belgium by the new system of locomotion, and an impulse was rapidly given to the execution of the works required for its introduction in the countries hitherto deprived of it, which works, in their turn, have influenced the style and manner of bridge-building, on account of the unforeseen difficulties the engineers had to encounter in the more varied conditions of the configuration of the country upon the lines of direction followed by the railways.

Between 1840 and 1848, however, the only remarkable characteristics observable in the majority of the bridges and viaducts erected for the railways then constructed in such numbers, were their large dimensions, and the simplicity, nay, almost the baldness, of their designs. The timber bridges of bent planks, before alluded to, were at this period often resorted to; and the timber lattice-bridges on the systems of Town and Long were at times employed on the lines of railway where it was essential to keep the capital accounts at the lowest possible amount. The general type of viaduct then adopted was the one to be met with in the Folkstone and Hitchin Viaducts by Sir Wm. Cubitt, or the Malaunay and Barentin Viaducts by Mr. Locke; but they rarely exceeded 100 feet in height or 50 feet in the span of the arches, which were usually semicircular. On some of the Midland lines, as near Birmingham and Rugby, viaducts of moderate elevation, upon semi-elliptical arches, were constructed; and on the extensions of the broad-gauge lines, Mr. Brunel erected some very elaborately scientific timber viaducts of great boldness of construction, but, as usual with him, those viaducts were utterly without elegance of outline. Many of the cast-iron bridges erected by Messrs. Locke and Stephenson were by no means deficient in taste; and such works as the Barnes and the Richmond Bridges of the former engineer, the bridge over the Trent, and the great High Level Bridge

at Newcastle of the latter, may be cited as illustrations of the style of art they practised. The other engineers of that period followed the path thus traced for them, and with a few slight personal differences, so to speak, the works of Messrs. Vignoles, Fairbairn, Bidder, Hawkshaw, &c., were strikingly like those of their great leaders. The Lockwood Viaduct, by Mr. Hawkshaw, is perhaps, in its way, one of the best specimens of a lofty stone structure of that description, and the quantity of material in the piers has been reduced in this case to a minimum; but on comparison of this work with the viaduct erected about the same period in France by M. Flachet, for the extension of the St. Germain Railway, the difference between the works of a man of talent, and those of a man of innate taste, becomes at once apparent. Mr. Hawkshaw, in fact, like the majority of English engineers, has given a straight face to his piers, whereas M. Flachet has given to his a curvilinear batter. Both of these eminent engineers, however, have made the mistake of not introducing impostes under the springings of the arches. In Scotland, Mr. Millar, about the same period, erected some stone bridges of a very remarkable character, amongst which may be cited the Ballochmyle Viaduct, the great arch of which has still the largest span of any stone railway viaduct in existence. Mr. Millar's works, however, bear little trace of artistic feeling on his part, and the Ballochmyle Viaduct is itself more remarkable for the boldness of its construction than for its agreeable effect. One remark may here be made with respect to the designs of nearly all the long English viaducts—namely, that they consist of a series of equal arches and piers throughout their length, without the introduction of any intermediate piers to strengthen the range, or to break the uniformity of the design. Constructively, a long series of equal arches and piers is objectionable; because if by accident one pier should fall, all the rest must follow, like a pack of cards. This actually did occur at the Barentin Viaduct; and the system adopted by M. Thoyot in designing the Beaugency Viaduct on the Orleans and Tours line, wherein the twenty-five arches are divided into five bays by means of intermediate and stronger piers, is both more logical and more satisfactory to the eye than the ordinary form of the English viaduct. In cases like the Dinting Valley Viaduct, Mr. Jee avoided this error of the long series of equal arches; but he did so by introducing the bent timber beams, and by making his central openings of large span—a course perhaps equally objectionable, for practical reasons to be hereafter alluded to. In the long viaduct connecting Venice with the main land, the Austrian engineers, for strategic reasons as well as for artistic ones, divided the arches into a series of bays, as had been done at Beaugency; but some of the German Viaducts erected about this period were of such gigantic dimensions, and they are so little known in England, that it is desirable to notice them in greater detail than those already alluded to.

On the Saxo-Silesian Railway there is a series of these constructions, such as those of Herrnhut, Ober-Cunnesdorf, Gross Schweidnitz, and Niethen, composed of semicircular arches of equal span, springing from piers with very

exaggerated batters. The Lobau Viaduct has seven large semicircular arches of 55 feet 9 inches span, and two smaller abutment arches, with a maximum height of about 100 feet from the surface of the ground to the rails. The Sprecthal Viaduct is divided into three bays of five arches each, the span of the centre arches being 55 feet 9 inches, and that of the lateral arches 27 feet 10½ inches, the maximum height being about 64 feet. The Bacthal Viaduct has seventeen arches of 55 feet 9 inches span, and a maximum height of about 59 feet. In all these works there is rather an affectation of architectural treatment, and rustic quoins, archivolts, distinctly marked voussoirs, are used, together with occasional panels, as though their designers had objected to large plain spaces. The viaduct at Aix-la-Chapelle is a remarkable work; so also are those of the Boberthal, of Goerlitz, Joannisbach, Deidenmulhe (the maximum height of this work is about 167 feet), and Gueulthal. The latter viaduct is only 120 feet high, but it is in two ranges of arches, on the system of the Roman aqueducts. In the gigantic works on the Saxo-Bavarian lines, however, this system of superposed arches has been applied on the grandest scale, and it is to them that attention is particularly called. The viaduct of the Elsterthal, in fact, has a total length of 892 feet, and a maximum height of 228 feet 6 inches; its elevation is irregular, on account of the occurrence of a river and a steeply escarped bank on one side of the valley; but in the upper range of six arches, the central one is of 100 feet 3 inches diameter, and the lateral arches are of 93 feet diameter: all the arches are semicircular. The viaduct of the Goltzchthal is even more gigantic than this, for its total length is 1900 feet, and its maximum height 263 feet 6 inches, from the summer level of the river to the rails' level. In the greater part of its length there are four ranges of arches, of about 46 feet 10 inches diameter; but over the river there are only two arches in the height, of which the lower one has a span of 93 feet 10 inches, and the upper one a span of 101 feet 3 inches. The materials employed in both these viaducts are a mixture of granite and of brick; and though the details are very far from elegant, and the variations in the spans of the arches rather capricious, the enormous dimensions of the works give them an air of sublimity of which we in England can hardly form an adequate idea: none of our viaducts attain more than half the height of the Goltzchthal one. The marvellous series of viaducts upon the road from Vienna to Trieste over the Soemering will be noticed when the period subsequent to 1848 passes under review; and it may suffice simply to notice here the works upon the railway between Genoa and Alessandria, because, although singularly bold, they do not display any originality of treatment.

In fact, both in Spain and in Italy, the period which witnessed such energetic efforts on the part of the nations of North-western Europe to develop the railway system was comparatively sterile. In Spain, a great number of concessions for railways were granted, but nothing of importance was effected towards their execution; and in Italy, the numerous "dominations and powers" were serious stumbling-blocks to the adoption of a system of intercommunication

whose natural effect is to centralize the intellectual, and consequently the political, life of nations. It is true that the Spanish Government about this period made vigorous efforts to improve the carriage roads of the country, and some of the bridges and viaducts erected for that purpose are worthy of notice, as in the cases of the viaduct at Orense, the bridges of Tablete, Izbol, Monzon, Cabriel, &c.; but they are still of very small dimensions, and serve strangely to point the moral of the sad tale of Spain's long misrule, and of her fierce civil wars. In the Swiss cantons some remarkable road-bridges were also executed in the period referred to; but they were not characterized by any originality of design, or by any new or peculiar methods of construction. In the United States, also, the art of bridge-building remained about this period in its ordinary and earlier state; and although the timber works of the Portage Viaducts, of the Harper's Ferry, and other bridges, and the aqueduct on the Croton Aqueduct, displayed considerable skill in construction, it certainly is not to America that the art student would turn for lessons in taste as applied to bridge-building. In new countries there is too great a demand for active energy to admit of the calm reflection necessary for the development of the artistic faculties.

However, to resume our tale. It was about the end of the period now under consideration that it was found desirable, in consequence of the local peculiarities of the districts to which the English system of railways was then extended, to discover some methods by which roadways should be carried over long openings, without its being necessary to raise their levels. For ordinary purposes the chain-bridges sufficed to secure this result; but these structures were considered to be, and really are, too flexible for railway traffic; and they were not considered to be sufficiently durable. Cast iron framed girders had been used, with a view of securing the necessary strength, without any increase in the depth of the beams; and Mr. Leather had even used cast iron suspension arcs on a large scale for this purpose, in the same manner as the one which Telford and Robert Stephenson had already adopted. The fall of the Dee Viaduct, at Chester, had, however, raised a prejudice in the public mind against the use of cast iron, otherwise than in the form of girders in one casting, or in that of voussoirs in iron arches; and, consequently, Messrs. Fairbairn, Vignolles, Stephenson, &c., were led to try experiments on the use of wrought iron. Whilst men's minds were thus turned expectantly towards the application of this new material, the exigencies of that most unreasonable body, the Admiralty, forced Mr. Stephenson, in the case of the Menai Bridge, to bend the whole of his energies to the solution of the problem, because there were no known means at the disposal of the engineer by which those exigencies could be met. With the aid of Messrs. Hodgkinson, Clarke, Fairbairn, &c., Mr. Stephenson began the long series of investigations, which at last led to the discovery of the laws of resistance of wrought-iron tubes and girders; and they were at once applied by him to the construction of the Conway and Menai tubular bridges,—for the road between London and

Dublin retained its privilege of exciting and taxing to the highest degree the energies of the engineer. The success of these wonderful works at once established the value of the new material, plate iron, for the purposes of bridge building, and its adoption became universal, as usual, without much reference to the conditions under which it was employed; for fashion in bridge building is as imperious, and as incapable of reflection, as it is in more frivolous things. Certainly, since 1848, wrought iron has been used in preference to any other material, and often so in cases where stone, brick, or cast iron would have been preferable to it. How long the fashion will last it is hard to say; even now there are signs of a return to old practice in some cases; but in the meanwhile, the indiscriminate use of wrought iron has been sorely injurious to the interests of the architecture of bridge building.

In the case of the Britannia Bridge, the height of the bottom of the tube from the water, and the enormous width of the spans, produce so overwhelming an effect upon the spectator, that he ceases to notice the utter want of composition in the design. In fact, the surrounding scenery rendered it desirable to avoid the introduction of any details able to interfere with the simplicity of the whole; so that the limitation of the design to the simple combination of the vertical and horizontal lines of the piers and of the tubes, allows the bridge to assume a character of absolute sublimity. This is not the case at Conway, for there the tubular girders look simply like logs suspended over the river, and the long level line of the top contrasts in an unfavourable manner with the broken skyline of the old castle. Neither of these bridges, however, are as elegant as Telford's chain bridges close to them; and when we turn to Stephenson's Victoria Bridge over the St. Lawrence, to the Railway Bridge over the Nile, or to Brunel's Chepstowe and Saltash Bridges, it is with feelings of dislike even to the material which could allow of the construction of such abominations—speaking of course artistically. The ordinary road bridges made of plate iron, such as those on the London and North Western Dock line, and the other metropolitan extensions, rival one another in their intense ugliness; and to such an extent has the neglect of taste, or elegance, in these structures been pushed by the modern engineers, that artists must almost rue the day when their colleagues were furnished with the inducements to sin against the laws of proportion and of optics, as they now so constantly do. This mania for torturing wrought iron into ugly shapes has prevailed to some extent on the Continent, as it has done in England; but the innate taste of southern Europe has preserved the French and the Germans from running into the extreme of ugliness our countrymen had reached; and, as we shall see, the nations of the Continent, even from the first, employed wrought iron in combinations which enabled them to introduce a more varied style of artistic treatment than was possible when box or plate-iron girders alone were used, as they were here, in the early periods of the application of wrought iron as the principal material for bridge building. In this respect the Report of the Commission to consider the Application of

Iron to Railway Structures did mischief in England; for, by setting their faces decidedly against the application of the lattice principle, they prolonged the reign of the solid-sided plate iron girders, so objectionable in ordinary cases for artistic effect, at least, whatever may have been their value constructively.

The English engineers, however, did not long submit to the species of law thus laid down for their guidance, and in a short time after the success of the application of wrought-iron to railway structures had been demonstrated, numerous manners of effecting that purpose were practically adopted. The bow and string bridges of Sir C. Fox, on the Blackwall line; the lattice girder bridges of the Boyne Viaduct; the Warren's girders of the Newarks Dyke, the Crumlin Viaduct, and some of the viaducts on the Indian railways; and more recently the use of wrought-iron to resist compression as in the Victoria Bridge at Chelsea, have proved at least that our engineers are willing to "try all things." In the class of common road bridges they have also lately erected some remarkable monuments, and such works as the Rochester Town Bridge (a strange contrast to the Railway Bridge by its side); the Victoria Bridge at Windsor, and the new Westminster Bridge, by Mr. Page; the Suspension Bridge at Chelsea by the same engineer; the very beautiful suspension bridges of Pesth, by Mr. T. Clark, and of Kieff, by Mr. Vignolles, &c., may challenge comparison with the analogous works of any previous epoch, although very great exception may be taken to the taste of all Mr. Page's bridges, which, unfortunately for the true interests of art, it is now the fashion to admire. The great viaduct for the railway in the valley of the Dee, near Llangollen, is a noble work, susceptible of improvement, however, by a slight change in the outline of the piers; the Border Bridge, near Berwick, is also a magnificent structure, bold, simple, and effective; the viaducts of the railway near Brighton are worthy of notice; but it is upon the great Indian irrigation works that the English engineers have achieved their most glorious recent triumphs. The Solani Aqueduct, upon the Ganges Canal, is in fact the most stupendous monument of that kind yet constructed, not so much on account of its height, but on account of the enormous volume of water it discharges; the sectional area of the water-way is, in fact, not less than 1800 superficial feet. It has 15 segmental arches of 50 feet span, and a total length of 1050 feet; in the latter respect falling short of the dimensions of the Godavery Aqueduct, which is not less than 2356 feet in length, but only has a water way of about 88 feet superficial; this latter aqueduct has 49 arches of 40 feet span each. Unfortunately, the designs of these aqueducts are as devoid of anything like beauty or picturesqueness of outline as it is possible to conceive them to be; and on looking at them, we are compelled to admit that the æsthetical doctrines of the school which hold that "utility is a source of beauty" are radically false. Yet Rennie, in the Lune Aqueduct, and the French engineers of the present generation in the Orb Aqueduct, have shown that it is easy to combine those qualities when the proper amount of study is devoted to the task.

On the Continent, the practice of bridge-building has of late been of a much more varied character than it has been in England, and the recently-erected bridges of France, Germany, &c., must be referred to as the most recent models for the student. Thus, in France, we may mention the great viaducts of Chaumont and of Nogent-sur-Marne, of Indret, la Fure, la Feige, des Sapins, Montciant, all of stone; and the Chaumont Viaduct of not less than 1968 feet in length by 162 feet 6 inches in maximum height, whilst that of Nogent-sur-Marne is 2722 feet long by 101 feet 6 inches above the water-line of the river. The stone bridges of Mont Louis, la Pile, Roanne; the iron bridges at Nevers, Tarrasconne, St. Denis; the wrought-iron bridges at Asnières, over the Allier, at Lagny, &c., on the various recently-executed railways, are all characterized by scientific and artistic qualities of a rare description. Upon the lines of ordinary carriage traffic, the French have also erected some important bridges, such as the Ponts d'Alma, des Invalides, d'Arcole, Solferino, St. Michel, &c., in Paris; of which the Pont d'Alma is worthy to rank with the best specimens of Perronet's school, and the Pont d'Arcole is the boldest attempt yet made to use wrought-iron in compression. The aqueduct of Roquefavour is a monument surpassing in grandeur every similar work of ancient or modern times, for it is 1279 feet long by 266 feet high, whereas the Lisbon Aqueduct is 223 feet high, and the Caserta Aqueduct is only 162 feet high. The road bridges of Grenoble, Menat, the completion of Mantes Bridge, the Bridge of St. Sauveur, and Saint Just, &c., are alike worthy of study, and perhaps the more so from the fact that the French engineers have not so completely abandoned the use of stone and other old-fashioned materials as we seem to have done. The same remark may be extended to Switzerland, where a very beautiful road bridge has recently been erected at Berne; and some striking viaducts, as at the Sitterbrücke and at Fribourg, have lately been erected. In Germany also, the bridges over the Rhine at Kehl and at Cologne may be referred to, as also the bridges over the Theiss, at Dirschau, Marienburg, Offenbourg, Leer, Ladenburg, Salzburg, Weisse, Grossheselohe, Sarstedt, &c., the bulk of which are, by the way, of wrought-iron lattice-work. The viaducts of Franzdorf, Schiltdsche, Beitingheim, and the countless series of viaducts on the Soemering, are worthy of all praise; and the stone bridges of Vienna, Schweinfurt, Ladenburg, Verona, Cocaglio, &c., are alike monuments of the German skill in this branch of architecture. Even the Papal Government has of late entered upon the construction of large public works, and the viaduct of Aricia, 1020 feet long by 200 feet high, with its three ranges of arches, looks almost like a revival of the ancient arts of the masters of the world. In the rest of Italy, the recently-erected bridges are of small dimensions; and indeed the great works on the Lombardo-Venetian lines belong rather to the class of the German engineering than they do to the indigenous Italian. In Spain, some important bridges and viaducts have been constructed for the new railways; but as they were nearly all executed by English or by French engineers, they do not display any local or national

peculiarities of feeling or taste which would require a special notice here: Spanish architecture and Spanish engineering at the present day are utterly devoid, in fact, of originality or of specific character. This remark may be extended to such nations as Holland, Sweden, Denmark, and Russia; for the arts of building, as practised in them, are ruled by a servile spirit of copyism on the part of the local engineers and architects, or the great works are directly confided to foreigners, who of course follow the same systems which prevail in their own countries.

Before closing this part of the subject under review, it is desirable to call special attention to the great suspension-bridge over the Niagara, built by an American engineer, Mr. Roebling, because the temporary success of this bridge certainly proves that the suspension principle can be applied for the purpose of spanning openings of great width in an economical manner, even when applied to railways. The durability of this Niagara Bridge is, however, more than questionable; but there are many cases in which it may be advantageous to erect a cheap temporary bridge, able to last simply until the traffic created by its very agency should afford the outlay for a more permanent structure. Little can be said in praise of the artistic effect of the Niagara Bridge; for the heavy lateral bracing and lattice-work of the roadway clashes very disagreeably with the aerial lightness of the suspension-wires, and the suspension-piers look disproportionally light; but this structure is an original one in its effect, and, on the whole, it commands admiration. Mr. Barlow has lately adopted some details of Mr. Roebling's work in his Lambeth Bridge, without any improvement in the artistic treatment; and on the Canal Bridge at Vienna, the suspension principle has lately been applied with considerable skill to the support of the channel for the water-way. As a general rule, at the present day, suspension-bridges are not the fashion, and even for light traffic and for temporary communications wrought-iron girders in some of their compound forms are adopted for those purposes, whilst for the more important bridges wrought-iron is almost exclusively used. This tendency is to be regretted, because, firstly, the durability of wrought-iron bridges has not yet received the sanction of time; and, secondly, because that material does not seem to admit of artistic treatment so successfully as do the more anciently used ones, such as brick, stone, cast-iron, or suspension-chains. Much of the prejudice against the latter-named description of monuments is attributable to the falls of several iron-wire suspension-bridges, which have taken place under such circumstances as to create a very painful interest with respect to them; but as the causes of these falls are easily understood and guarded against, there can be no valid reason why that particular mode of construction should be so entirely abandoned as it actually is. Under any circumstances, it must be a matter of regret to witness the universal preference for a style of construction which can admit of the execution of such fearfully ugly works as the new Hungerford Bridge, or as the new road-bridges on the railway extension lines of the metropolis. The introduction of the system of tubular foundations for river bridges has in

some degree tended to render that class of monuments less satisfactory to the artist than they were wont to be, because the strict parallelism of the tubes exaggerates the awkwardness of the effects of the leading lines of the girder bridges. Instances of this defect are to be seen in the Hungerford Bridge above mentioned; in the Bordeaux Bridge of the Orleans and Southern railways of France; and in the Albert, or Saltash, Bridge—in fact, in all the cases wherein engineers have entirely cast aside the study of artistic elegance to confine themselves to the strict requirements of economical construction.

ARCHITECTURE AND ITS RELATION TO CIVILIZATION.

We can never be too accurate in our definitions, whether they relate to science or art; hence we shall be pardoned for any repetitions in our illustration of what we understand by architecture. A popular authority says:—

“An excavation in a rock is not an architectural work, unless it possesses a certain symmetry and certain ornaments which characterize other similar works, so as to enable us to refer it to some class or kind of construction. Where such instances of excavations occur, the ornamental or architectural part is obviously only the copy of models in wood or stone previously erected on the earth. Such is the character of the rock temples of Elephanta, and the rock-cut tombs or temples in Nubia. The rude Pelasgic or Cyclopiian walls of Tiryns, in the Peloponnesus, and other similar structures in Italy, possess a distinctive character which is seen in a more advanced state in the military fortifications of Mycenæ, where we find also, in what is known as the Treasury or the Tomb of Arceus, a very remarkable subterraneous structure of nearly as early a date, and the only instance, as far as we know, now existing in Europe of a construction in stone combined with the sister art of sculpture. We refer to the sculptured figures in high relief, commonly called lions, which stand over the great gateway. But even these can hardly be considered architectural works.”*

The early existing monuments in Great Britain which are supposed to be anterior to the Roman invasion of this island are classed, whether correctly or not we shall not here inquire, under the general term Druidical or Celtic. The most remarkable of these monuments, both for preservation and arrangement, is Stonehenge, on Salisbury Plain, in Wiltshire. Here we find stones, some of very large dimensions, placed upright in the ground, and forming a series of concentric circles. They are not merely rude masses, like those of Avebury, near Silbury Hill, but they have evidently undergone some shaping and rubbing down, so as to form tolerably regular parallelopipedons. We here observe also two stones placed upright like posts or pillars, and another large stone placed over them like an architrave or lintel. The lintel is also secured by means of mortises and tenons. All this indicates certainly a

* “English Cyclopædia.”

regular principle of construction. But with the exception of a few inquirers, who are perhaps disposed to overvalue Celtic remains, can any careful antiquarian trace the forms of our oldest churches and other ancient edifices to the rude masses of the British monuments in this island? It is an historical fact that the Romans introduced into England their own principles of building; and it is equally demonstrable, that with the exception probably of the arch, Roman architecture, as it is known to us, both from existing specimens and written books, is a modification and adaptation of Grecian architecture. It was probably introduced among the Romans by Greeks, and certainly practised by them, even under the emperors. If we then trace the progress of architectural construction from the Greeks, through the Romans, to its introduction into Western Europe, we may fairly assert that *architecture*, in its strictest historical sense, implies the adaptation of Grecian models to the buildings of our own times.

A building may be well arranged for all purposes of convenience, but if this is all, it is not an architectural construction. To possess an architectural character, it must combine internal convenience and fitness with beauty of external form, and with durability. If the external arrangement of a building should be compounded of those of several nations, such as Hindoo, Egyptian, and Greek, we should not admit this to be an architectural construction, even if the external form gave pleasure, which, however, is hardly a possible result; for it is essential to the character of an architectural structure, that the general arrangements and ornaments should have a unity of character and be referable to some one model.

Architecture arose, in fact, from the combination of sculpture with construction. *Building* may be older than sculpture, but sculpture combined with building produced architecture. From the Homeric poems we deduce only very vague ideas as to the structure of temples and palaces: we find no distinct indication of the arrangement of columns, which are the very essence of Greek architecture.

It is worthy of remark, though it seems to have escaped the observation of many writers, that the nation to which Europe is indebted for the elements of its architecture, is also the nation to which we are indebted for our knowledge of geometry. The law of the mind which gave birth to the simple forms of the triangle, the circle, and the square, gave to man the elements of all his works of art. We are not aware of any nation that has had a system of architecture which has not also had a style of sculpture, nor do we know of any nation that has carried architecture to perfection, or even to a degree of excellence of its kind, that has not also had a system of geometry and arithmetic.

We have endeavoured briefly to show that architecture, *historically* explained, is the mode of constructing edifices which we have received from the Romans and the Greeks. But with the establishment of Christianity, and its diffusion over Western Europe, a gradual modification was made in the forms of buildings devoted to religious worship; for it must be observed, that it is principally in the religious edifices of a nation that we find the essential principles of

its architecture exhibited and preserved. This remark applies with equal truth to all nations that have left behind them some examples of a definite style of building. The great ecclesiastical structures of Western Europe now exhibit a character in appearance very different indeed from the models of Greek and Roman buildings. They gradually deviated from the heavy and rounded Norman arch, the type of which is undoubtedly the Roman arch, to the pointed and light constructions generally denominated the Gothic. That foreign ornaments of a barbarous, or at least incongruous, style were occasionally mingled with them by the numerous architects of the Middle Ages, cannot be denied; but still in the early ecclesiastical, and also in many of the civil structures of Italy, Germany, France, Flanders, and England, a distinct and new character of architecture may be seen; and this distinction became again so marked in the several countries of Europe, that the Gothic or Pointed styles of England and various continental countries have each a distinctive character, though they may all have had a common origin. The architecture of a people is an important part of their history. It is the external and enduring form of their public life, and index of the state of knowledge and social progress. Architecture, therefore, to be understood aright, must be considered historically—must be considered, that is, in connexion with the whole public and social life of the several nations in which it has been practised, and the particular times and circumstances in which it has flourished. The architecture of the ancient Greeks, or that of the various European nations during the Middle Ages, would be very imperfectly understood, if the architectural remains were studied apart from the external or inner history of the countries in which they are found. On the other hand, the existing edifices serve to illustrate and elucidate much that would without their assistance be but imperfectly comprehended.

No national architecture has ever been self-originated or invented. The architecture of every age and country where true architecture has existed, has grown out of some previous architecture. The architecture of Greece, the purest architecture which the world has ever seen, may be traced back to Assyria and Egypt. The architecture of Rome was derived immediately from Greece. The Oriental imagination transformed this into Byzantine; the Occidental into Romanesque; and borrowing something from both of these, the mind of the thirteenth century produced the Pointed or Gothic style, which the architects of Italy, France, and England modified to suit the wants and characters of their respective countries.

But always it was a modification, adaptation, or development of a previous system, not a reproduction of it. No true architecture has been merely mimetic. Though the architecture of Greece derived its germ from Egypt and Assyria, it developed into its perfect beauty and suitableness only by the free influence of the Greek mind. So that of Rome owed whatever of beauty and fitness it possessed to its departure from, not its conformity with, the Greek type. So, whatever there is of grandeur and glory in the wondrous Gothic of the Middle Age, dates

from its emancipation from the classic form. No imported architecture has ever been lasting. In our own country we have tried this, and the failure is palpable. Our architects have erected copies of the temples of Greece and Rome, alike for churches, museums, and town halls; and however much they have been admired while the fashion lasted, and scholars imbued with classic ideas gave tone to public opinion, almost before they were finished the fashion passed away, and they are now regarded with general dissatisfaction. To the Greek succeeded the Gothic, and though the passion for it be still fervid, the opinion is evidently fast gaining ground, that Gothic reproduction is as essentially vicious and untrue as that which it has supplanted.

In fact, we may hope that we are in this country coming to understand that whilst an absolutely new style is a thing neither to be desired nor looked for, and that an eclectic style is an absurdity, the architecture of every age, as well as every country, to be a true living architecture, must be a product of that age and country, adapted to its special wants and circumstances and character, developed out of some previously-existing architecture, but adapted with perfect freedom to present purposes, and embodying to the fullest possible extent the scientific knowledge and artistic feeling of the present time.

If this be so, the question of style will eventually, perhaps, at no very distant day, settle itself. It will be felt that in every building there is a matter to be determined antecedent to all considerations of style. The first grand requisite is, that a building shall be designed so as to answer as perfectly as possible the purpose for which it is erected; shall, in other words, possess the greatest attainable convenience and stability. When that is arrived at, the feeling for beauty and grandeur in the architect who has rightly studied his art will suggest a style—an outward and visible clothing of the actual body—which shall be as evidently in conformity with it, and the more beautiful because the more suitable for it, and be as properly adapted to the purpose it has to fulfil, and the locality in which it is placed, as the form and clothing and colour of an animal or a flower are recognised to be the most beautiful, as well as the most suitable, with which it could have been endowed.

Ornament is an essential part of architecture. Without ornament there is no true architecture, only building. But it is a misconception of the true purpose of art to say that an edifice is erected for the sake of ornament. Architecture consists of structure and ornament; but ornament must not be a thing extraneous to the construction, a something added to it merely to please the eye. True ornament is the expression of the idea of a building. Equally with the building itself, the ornament must possess unity, proportion, congruity; be a well-considered whole to which every part conduces, and of which every part is a part.

THE Bodleian Library possesses a collection of drawings of French monuments, for the most part now destroyed, which formerly belonged to the Bibliothèque du Roi, but were abstracted from that place by one of the curators, between the years 1781 and 1784.

THE BLOCKS OF BETON IN THE INTERNATIONAL EXHIBITION.

AMONGST the productions of French industry and ingenuity displayed in the International Exhibition are a few blocks, which in colour resemble Portland stone, and in hardness and density may even be said to surpass granite. But for the fact of their being catalogued and numbered, one might suppose them to have been placed in the vicinity of rich silks and laces from Lyons, Valenciennes, and Chantilly, by causes not less accidental than are sometimes boulders on alluvial plains. Their juxtaposition to much of what is beautiful, fanciful, and brilliant, or to specimens of engineering skill in that state of completeness more explanatory of design than words can be, throw them so greatly into the shade, that few take the trouble of examining them, or of ascertaining for what purpose they have been made. Yet the production of these blocks was effected at the cost of about as much patience, time, and trouble, as was the porcelain of Bernard Palissy; and perhaps more capital was expended on them than was expended in producing the brilliant treasures of Messrs. Hunt and Roskell's cases, which daily attract such a host of fair admirers. M. François Coignet, the inventor and patentee, on seeing several years ago the failure of M. Vichat's asphalté, when applied to the construction of houses and hydraulic works, with an energy worthy the countryman of the Huguenot potters, set about discovering a composition that would rival in durability, hardness, and solidity some fragments of asphalté which were then found in the remains of Roman aqueducts and thermal baths in the south of Europe. All the scientific knowledge which was acquired by him in the "Ecole Polytechnique," and in after-life by profoundly studying chemistry, was brought to bear upon the problem which he resolved to work out; and two brothers, who were at the head of one of the wealthiest manufacturing establishments in France, gave him all the assistance which capital can afford. In the course of eight years, several thousand experiments were made with various degrees of success. But throughout that period, the chief result of so much effort was, in learning that as long as asphalté required to be moulded it would, unless for pavements, be more expensive, less durable, and far less impervious to weather than either brick or mortar. Before such cement as that used by the Romans could be manufactured, M. Coignet found that a lesser quantity of water than had hitherto been employed in the fabrication of modern asphalté would be necessary, too great a quantity having the effect of rendering crystallization impossible, and preventing the agglomeration of the molecules of the lime, which formed a principal element in its composition. Independent of the expense which was entailed by using asphalté, and the boiling state which rendered moulds indispensable, there was another equally serious drawback. The water, in evaporating with the rapidity with which hot water always does, rendered M. Vichat's asphalté very porous and the reverse of water-proof, as well as very brittle when exposed to the action of frosty weather. The experiment was then

tried of introducing it more sparingly, and of using the asphalt several degrees below boiling-point, but with signal failure, as the lime was then in excess and did not amalgamate with the other elements. It subsequently occurred to M. Coignet that were sea-sand substituted for gravel in the fabrication of asphalt, it would greatly improve its quality, and when tried it was found to do so. But still perfection was not attained. Coal cinders, schist, and clay were next added, with considerable success. However, the quantities of moisture which each contained rendered their application of extreme difficulty, to remedy which the erection of drying kilns was found to be indispensable. M. Coignet at length considered that his labours were ended, and his most sanguine hopes fulfilled. However, atmospheric changes had a most damaging effect upon his work. It did not always do to take the asphalt—or, as the inventor more properly calls it, *bétons agglomérés*—out of the cauldron at the same degree of heat; or, rather, it was requisite to vary its heat according to the heat of the atmosphere in which it was applied to building purposes. To go into all the details of the thermometrical experiments then made would require a Frenchman's pen, and a far greater amount of space than can be now accorded. It suffices to say, that they were made with as much hair-splitting nicety as was displayed by the Revolutionary committee when altering the national system of weights and measures. This ordeal passed through, experiments were made with the most signal success, and M. Coignet flattered himself that his *bétons agglomérés* would attain as wide-world a reputation as plaster of Paris or Roman cement. The first trial on a large scale which was made of them was during 1853, at St. Denis, near Paris. It was in the construction of a gasometer and an extensive manufactory for substances of a highly combustible nature. The firm for which the latter was built had hitherto paid annually a very heavy sum to insurance companies, and were naturally desirous of lessening it. To effect that end the rafters, joists, door-posts, window-frames, roof, and floors, were made of the same material as the walls, and destruction by fire thus rendered impossible. This factory has ever since been an object of some interest to the principal engineers of France, and the effects of the weather on it are closely scanned by them; but as yet they have not been able to make an evil report.

The *bétons agglomérés* were next employed in the construction of a handsome villa in the suburbs of Paris. With the exception of the doors, panelling, window-sashes, and Venetian blinds, no wood was used in building it. Houses, offices, and a terrace that extends for a considerable length along the Seine, are all formed without any apparent joining, and in point of fact may be considered in the light of a single block. What the whole thing cost it is not in our power to state, but we have received the assurance of M. Coignet that it was not nearly so expensive as it would have been if constructed of ordinary materials. From our own personal experience we can also state that the inmates of this villa are less exposed to the effects of heat in summer and cold in winter than are those of brick or stone houses. The unpanelled por-

tions of the walls do not, like those of French houses generally, drip with damp during the thaws that take place in January or February; and so impervious are the *bétons agglomérés* to the action of humidity, that the roof is flat and capable of being converted into a flower-garden without discolouring the ceilings immediately beneath it. They are also susceptible of the most delicate moulding that is requisite for architectural decoration, and of such hardness, density, and resisting power, that the Emperor Napoleon has ordered them to be experimentally employed in a breakwater near Bayonne, a reservoir, and the arch of a bridge at the Ecole des Ponts et Chaussées, some military constructions at Vincennes, as well as park-rangers' houses; and a *cité ouvrière*, with the roof laid out as a garden and playground for the children of the inmates, has been spoken of already. Should these experiments be successful, the invention of M. Coignet will be of wide-world importance now that monster warehouses and hotels supersede shops and inns, or model lodging-houses, and such habitations as were lately erected in Columbia Square are found to be the most effective way of moralizing the working-classes.

ON THE ARCHITECTURE OF INDIA.

A LECTURE, BY I. SIMPSON, ESQ.

In February of last year I visited all the principal places of Rajpootana, and amongst others the ancient city of Cheetore. Previous to this, from what I had seen at Delhi and Agra, I had formed the opinion that the Mahomedan architecture was far finer than that of the Hindoos; and from what I had then seen, perhaps it was a correct conclusion; but my visit to Cheetore completely shook this first impression, and gave me such a high notion of the Hindoo powers, that I now consider it an open question as to which is best. Some might lean to one side, while some might prefer the other, as tastes or, perhaps, accident might lead them; but I would advise no one to give judgment on the comparative merits of Hindoo and Mahomedan architecture till he has seen the vast ruins of Cheetore.

Cheetore is placed on a plateau forming the top of a low hill, and is about three miles long. Within this three miles is one vast mass of ruins, formed of temples, towers, palaces, gates, tanks, fountains, &c. Fragments of sculptured stones are in heaps in every direction. The road leading up to this old fortress is paved with sculptured remains. The walls are composed of odd fragments. Temples are built of the remains of still older temples, making a confusion from which it would take a very long time to make out order, and trace the origin and history of all the varied sculptures and designs. Cheetore was the ancient capital of the Rajpoot tribe of Mewar, whose royal family trace their descent to the God Rama. The Rajpoots at one time represented the chivalry of India, and their history is full of the noblest deeds; and nowhere did those deeds assume a grander form than they did at Cheetore. The defence of that city by the Rajpoots

against the invading Mahomedans is a history which any nation might be proud of. The history of this people, and the ruins of Cheetore, point in India to the same law which holds good all over the world;—that greatness in arms and greatness in art go together; that it is only those who can do noble deeds who can produce noble works.

The first building which strikes the visitor when he begins to look around him is the Tower of Victory, built by the Rana Khoombo, in the fifteenth century. It is 122 feet high, and composed of nine stories; it is one vast mass of sculptured details, and contains the whole of the Hindoo mythology. It is carved inside and out. The white dome on the top must be, I think, a Mahomedan addition, or an alteration. I was very much struck with the size and quantity of work on this building; but still I was finding fragments of sculpture about my feet which were far better than those on the tower. This indicated a falling off from the earlier period; and at last I got a perfect confirmation of this in a smaller tower, said to be built about the year 896, 400 years earlier. This tower is only 75 feet high, and is of Jain origin, being dedicated to Adnath, the first of the twenty-four Jain pontiffs. That it is a Jain building is indicated at once by the full-length figure in reddish stone. My sketch of this beautiful work is very imperfect, the details being only here and there suggested. It was only when I was about to leave that I found out this tower; so my time was of the shortest, or I would have made drawings of a good many of its details, which were of the most perfect work, done with the most remarkable precision of execution. I had seen the most of the forms and designs in other temples about India; but when I looked upon this tower, they all seemed but rude blundering copies, of which this might be taken as the original standard of excellence. It is always interesting to determine when any style was at its best. Now, I feel that my knowledge of the Northern Hindoo is not sufficient to justify any conclusion. All I can say is, that this piece of ninth-century work is by far the best I have ever seen. This smaller tower has much more variety in its general design than the more modern tower, which is almost a series of repetitions all the way up; but it is in the exquisite details of the ornament that the Jain tower excels. There is one noble ornament composed of elephants in action. I do feel sorry that I had not time to make out a few of these details. One of the most common decorations is that of a diamond within an upright parallelogram: this often forms the ornament of a plinth running all round a building; and although very simple, the effect of it is particularly good. This diamond within a parallelogram is the simple element of a great deal of the Northern Hindoo decoration, and out of it a great variety of ornament is produced. I give you a couple out of many: in one, the diamond becomes a quatrefoil; in the other, you have again the quatrefoil; and in addition, the space between the oblong niches has become a miniature pillar. If you look into some rough details which I have shown of a Jain Temple at Ajmere, you will see it all over them; and you will see

that on the square part of the pillars at the base it is repeated round all the faces, one large diamond on each, which, from its size, is made into a very important ornament. You will also see this diamond pattern among the details of the Golden Temple at Benares,—a very modern specimen of Northern Hindoo: here you will find that it is still more enriched than any of the older specimens. Another common ornament of this Northern Hindoo, and one which figures largely at Cheetore, is a kind of half-rosette in a semicircle, and a string of beads all round below. This is really a very fine, effective ornament, and very rich in its appearance. The beads which surround the semicircle, I think, have had their origin in some species of jewellery worn at the date when this ornament was begun; for all the figures of that period are sculptured with stripes of beads hanging about them, just like this feature of the ornament. Their shape would suggest that they might be pearls, which is not unlikely in India; and the rosette may have been derived from some jewelled original also. There are varieties of this ornament, as there are of all those in India: in fact, there are a set of types which contain nearly all the ornament of the country; and if one had these, they could be all easily arranged and classified. I feel certain that, with time, I could have done this; and I think, from what I am showing you, that it would only be a matter of time and so much industry to collect the materials. Of this last ornament I give you a variety. It is a very handsome one: the semicircle is filled up with an elaborate bit of work, and the string of pearls is wanting, but a notched piece runs along the top. This notched pattern is again repeated in a curious design which I copied at Bilsah: it is a series of zigzag squares cut deeply, and lines grooved all along, producing a very simple but pleasing effect. There were also many varieties of this, and I think it is one of the oldest ornaments,—I should say, Buddhist, and of wooden origin; for it has the look about it as if it belonged to that period when ornamentation was produced by cutting notches in a piece of wood. There is one other common ornament in the Cheetore buildings; that is, a row of something which always looked like fantastic grinning heads. I have shown a specimen of it; but it is not a good illustration of the thing. There is another ornament given which I copied from a temple near Cheetore. I found it always running round the edge of the door of the temple. What surprised me was that so much of that old ornament should look so very like our modern work all over Europe,—in fact, being not unlike Louis Quatorze or Rococo work,—and only requires to be introduced into a picture-frame of the present time and gilt over, to look like a production of the western world instead of the far-east. In Cheetore and Ajmere, as well as all over Rajpootana, my eye was always meeting with details which produced a remembrance of something classic. If you minutely inspect my rough details of the Jain Temple at Ajmere, I think this character may be seen in some of them. Now I read lately that Greek workmen did come to Western India in past times, which is not impossible, with the facilities of passage afforded by the Persian Gulf.

Could it have happened that fragments of Greek art were thus introduced, and grew into those details as we now find them, just as Louis Quatorze and Rococo grew in the West? I should doubt it myself, but I merely suggest it as a contingency which might have happened. I also show an old gate from Cheetore, with a very beautiful pillared bracket. This bracket I have drawn large to show its details better. You will notice that this gate, like many buildings in Cheetore, is built of older fragments, in which some of the ornaments I have been describing are visible. From Oodeypore I show some sketches: one is a very fine bracket; another is a ruined house, showing the bracket capital: this is in the common building of the bazaars. There is also a sketch of the Temple of Juggernath, a fine large building in the northern style; but the large flight of steps and full-sized elephants are, I think, peculiar to Rajpootana, and are very grand in effect. Oodeypore struck me, as I think it does all who have visited it, as being one of the finest cities in the world: this it derives from its position. The city overhangs a lake some miles in extent, on which are one or two islands with summer palaces on them; the largest of which belongs to the Rana. The palace on this island is very beautiful: marble summer-houses, of elaborate design, are mixed up with gardens, fountains, tanks, and flowers; making the most fairy-like spot the mind could conceive as belonging to the land of the East. The whole is surrounded by fine mountains, which are rendered doubly picturesque by ruins of towers, crumbling walls, and old temples. This place is out of the usual track: few Europeans visit it; so it and its ancient predecessor, Cheetore, are little known in comparison with such places as Delhi or Agra.

The old Jain temple at Ajmere is another of the most interesting of these specimens of Rajpoot architecture. It is believed by the natives to have been built by some kind of fairies in two nights and a half. Todd thinks it dates as far back as 200 B.C. Where a man like Todd speaks, it would be presumptuous in me to doubt; but I feel a difficulty in believing that it dates so very far back. When the Mahomedans got Ajmere they changed this temple into a mosque, in the same way as they did at old Delhi, by building a large row of pointed arches, which are very elaborately carved: in fact, between ornament and texts from the Koran, there is not a particle of plain space left. The original Jain Temple was a series of domes built on lintels, these lintels again being supported by long pillars. The domes are not constructed on the principle of the arch, but from each course lapping over each other, each course being formed into a circular belt of ornament. The lintels from which the dome rises are in plan an octagon; and you will see the peculiar form of the bracket capital by which these lintels are supported. Also notice how the bracket is carried up to support the first course of the dome, which assumes the sixteen sides, and is so near the circle that the dome rises from it without another break.

I now come to the architecture of Cashmere, that is, to those important remains of Hindoo buildings of which

there are a few most interesting specimens; and I think I have exhibited to-night drawings of them all. They are all old, but not so old as I should have expected; ranging from the sixth or seventh century to the eighth or ninth (I am here speaking very roughly about the dates of these buildings; but a little reference to history—for architecture is always linked with history—will explain their date). Buddhism began in India about the fifth century B.C., and was the dominant religion of the country for somewhere about a thousand years, when the Brahminical faith began to get the ascendancy; and by the sixth or seventh century after Christ the religion of Buddha had ceased to exist on the plains of India. The remnants of the Buddhists who did exist adopted a modified faith, somewhere between Buddhism and Brahminism, and which is to be found in India to the present day. This is the doctrine of the Jains. It would seem that there must have been a fierce contest between the Brahmins and the followers of Buddha at that early date. The Buddhists lived in monasteries, as they do in Ladák at this day, and in a style as near as can be to that of the same kind of establishment in Europe; and there must have been some Henry VIII. of the period in India who made a good thing of these institutions, for they also were rich and royally endowed; the measures used for their suppression must have been of the strongest; for some gentlemen who made explorations at Sarnath, near Benares, found masses of old ruins in a state which nothing but burning could have produced. The principle of "pulling down the nests, and the rooks would fly away," seems to have been strictly adhered to; and this may help to account for the scantiness of Buddhist remains in this part of India: and be it remembered, that the neighbourhood of Benares was the place where Buddhism originated, and was more or less its headquarters; of course one would expect to find the most ample remains of their work in such a locality. According to Colonel Cunningham's work, it was after the meeting of the third synod, or convocation of Buddhists, at Patna, on the Ganges, about 241 B.C., that they sent out missionaries for the conversion of the whole "Himalays." Amongst those sent out was Majjhantiko, whose mission was to Cashmere and Peshawar, where he is said to have ordained 100,000 persons. He was at first opposed by Naga, king of the Araválo, or Wuler Lake; but he was finally converted, and the "land glittered with the yellow robes:" such is the phrase by which the triumph of the faith is always expressed.

I believe there are Buddhist remains in Cashmere, although it was not my fortune to find any of them; but the dates of these Hindoo remains agree with the downfall of Buddhism. They were erected by the Brahminical powers on their ascendancy, which they held until the conquest of that country by the Mahomedans, who in their turn treated the Hindoos somewhat in the way they had formerly served the Buddhists. They filled the insides of what were to them temples of idolatry with wood: they heaped up trees on them, and made a grand *auto-da-fé* as a triumph of the faith of the Prophet. Had it not been for this, these temples, from the massive way they were

built, would have been as perfect to-day as they were at the first. The stone was capable of a very high polish; and so perfectly had the great temple at Martund been polished, that it is described as having "shone like the sun." Now it is all chipped and fractured in a way which nothing but burning heat could have produced; making the ornamental details very difficult to make out. It is supposed by some that this temple never had a roof, or that it was made of wood. My own impression is, that from the solid substantial style of the building, and from the completeness of this style in all its parts, they would all be finished alike; and that it must have had a high sloping roof, such as you will see in the drawings of the other Cashmere buildings. The only one of these buildings which has not been destroyed by fire is a very small temple at Pa Yetsh. It is said to have been damaged by an earthquake, which has shook the large terminal stone of the roof out of its exact position. The style of all these buildings is very peculiar, quite unlike anything else in India. Instead of being like the architecture of India, your first impression is that it is Gothic. This is from the high pediments and the spire-like roofs and general constructive appearance; but a little closer inspection shows a stilted arch, which is more Saracenic than according to our usual ideas of Gothic. A still closer inspection reveals a mass of mouldings and details which, if not Classic, can leave no doubt on the mind that they have been derived from that source. There is one sketch of some details which I did at Martund, which is a very remarkable illustration of this Greek or Classic character. Were I, in a general company, to throw down that sketch, and say that it was a sketch in Athens; unless it was minutely inspected, the statement would not be likely to be contradicted; and, if the stilted arch with the high pediment over it were covered up, it would require a man well up in architectural details to find out that my statement could not be correct. The column in that sketch which looks so like the Doric has not got the flutes the same. They were a little hollowed out; but so very little, that I think they were intended for flat surfaces. In this I am confirmed by a fragment of a very large pillar in old Srinugger, of which I exhibit a sketch. There the flutes are perfectly flat. This pillar has been surmounted by four female heads and arms, portions of the arms being still visible. It is, I should guess, about six or seven feet in diameter. Old Srinugger has suffered in the same manner as most old cities with a new city growing up beside it—it supplies the place of a quarry. All along the side of the hills you can see where the old city stood; but there is little of it left; but what it was like may perhaps be indicated by that fragment of a pillar and another fragment of a colossal statue, of which only the lower part remains; and occupying a very conspicuous part in the tomb of a departed Mussulman, I found the capital of a column, of which I show you a sketch, and from it you may form an idea of their power of decoration. I take them to be Brahmah's ducks, which I ought to mention is a favourite ornament of the Hindoos all over India; and, as grapes grow in the valley of Cashmere, I think that is what they

are represented as feeding upon. The capitals of the little temple at Pa Yetsh I found were the same as this. The temple called Pandrenton, at Old Srinugger, is in the middle of a tank. The tank is now a mass of duckweed and stuff through which snakes glide about, so I could not get near enough to make out the details. There are two temples at Puttun; and you can see, by comparing them with the figure introduced, the large size of the blocks used to build them; and if you look to the base of the pillars you will see how very Greek they are in form. In a gutter in the village of Puttun I found the capital of a pillar. I also submit a sketch of it. It looks marvellously like the Ionic scroll; but it may only be the turn of the Hindoo bracket a little elongated. I also submit some details of a building which is now "Classic." It is that described by Moore as the last scene of "Lalla Rookh." This is a Mahomedan work, and may date about the time of Akbar, about the middle of the sixteenth century. The pillars are of a beautiful black porphyry, and said to have belonged to a still older Hindoo temple. Here Noormahal is supposed to have sung her song,—

If there's an elysium on earth it is this! it is this!

While I was there some enthusiastic admirers of "Lalla Rookh" tried to realize the days of Noormahal, by getting the Shalimar illuminated and all the fountains playing. The best dancing-girls and musicians were hired for the occasion, and where Noormahal sang they performed; and as the east is so stationary in its manners and customs, I suppose this "get up" must have been as like the real event as need be. One thing I can safely say, it did not look like the nineteenth century.

While on the architecture of Cashmere I have one other sketch to allude to, that is, the Manikiala Tope. This is not in Cashmere, but in the Punjaub, near Rawul Pindee, between the Jheelum and the Indus, and within sight of the Pirpanjal range, which separates Cashmere from the plains. This is on the route by which Alexander passed, and not far from where he had the great battle with Porus, at the Jheelum; and here again there are clear remains of Greek art. This tope looks as you approach it like a very gigantic plum-pudding; but as you near it, mouldings and pilasters begin to be visible. The most of the outer facing of stone has tumbled off, and the lower range of pilasters which formed the base of the building are covered up. These are only visible at the spot where I suppose General Ventura opened it; and from this side I have made my very rough sketch. All the capitals of these pilasters are so decayed by time, that it requires close inspection to make out what they have been. But no doubt was left in my mind that they are Greek, of the Corinthian order. I have given drawings of two of them; and if that is not enough, there is a hastily-done section of the frieze, which I think establishes the Classic character itself. I did not see any of the topes in this locality or Peshawur; but details of them would be very valuable, to throw light on this as well as the architecture of Cashmere.

I come now to the last style in which anything worthy of the name of architecture has been produced in India:

this is the Mahommedan; and I naturally turn to Old Delhi, where the Mussulman manifested his supposed superiority over the Hindoo by eclipsing the temple by a mosque which would surpass the Hindoo work by its size as well as the beauty of its decoration. That the Mussulmans have eclipsed what is left of the Hindoo work at that spot, I think there can be no question; but that they beat every other effort of the Hindoo, my remarks on Cheetore will show you that I am not so certain.

There are rival claims between the Hindoos and Mahommedans about the Kootub Minar; but after I had become acquainted with the details of the Hindoo style, the question seemed very clear. At the time when the Mahommedans built the Kootub, they had not the workmen necessary for such a work; and, of course, employed the men of the country, just as we do at the present day. These men did not know the style of their employers; and what was more natural than that each man should just work as he had been accustomed to? And so we find that these buildings, although Mahommedan in general design, are almost all Hindoo in their decorative details. Even the *bell*, which is so thoroughly Hindoo, is to be found on the Kootub Minar itself. Even the great arch is not built as an arch, but in the only way in which the Hindoo was accustomed to produce such a thing. These Hindoo details do not make Hindoo buildings; they only show how few workmen the Mahommedans brought at first, when they could not get an arch constructed, and when they permitted such an idolatrous emblem as the bell to appear on their mosque. The latter buildings show more of the Mahommedan style of decoration; and at last, as they increase in the country, we almost find the Hindoo ornamentation disappear; and the next change which took place was the Mussulman's adopting a great many features of the Hindoo construction, ornamenting all with their own beautiful tracery and geometrical fretwork. This lasted till the time of Shah Jehan, when European art first makes its appearance; and from the influence of which the native art got completely ruined, and, as I believe, nothing that was worthy rose to supply its place. You find there a still more wretched history than the history of the revival of Classic art in Europe. It produced the complete extinction of native taste, and the extinction of all endeavours to use that taste for the production of the beautiful, which I believe all possess, and all could manifest. At the present moment architecture is a blank in India; and if they had the task assigned them of producing a great memorial at the present day, I fear they would be in about as great a fix as ourselves.

My estimation of the best period of Mahommedan architecture in India is about the fourteenth century. About the end of the fourteenth century there was a shah called "Feroze the Architect;" and in the Poorana Keelá, one of the old Delhis, which is also called "Feroze Shah-abad," there is an old mosque, which I should call the finest mosque in India; and there is no other specimen of Mahommedan work to compare to this, unless it be some of the old fragments about Old Delhi, one of which is a tomb at the foot of the Kootub Minar, the date of which

I do not exactly know, but I think it is older than the mosque, for it has a good deal of Hindoo details on it. The mosque is principally composed of the red stone of which all the buildings of Delhi and Agra are constructed; but it is varied with white and black marble. This building is not so well known as the other sights of Delhi, so a visitor is not so likely to see it; but it has only to be seen, I think, to be appreciated. From this period there is little to notice till you come down to Akbar's time,—a name evidently the greatest that India ever produced, and a man who left his mark on that country more than any other man. From Delhi to Cashmere there are serais, or caravanserais, which he built: from Agra to Ajmere, in Rajpootana, there are remains of his; and the house I slept in, in Ajmere, I was told Akbar built. He had three wives—a Mahommedan, a Hindoo, and a Christian; and besides combining the different religions in his domestic arrangements, he formed a sort of eclectic system, combining the good qualities of Mahommedism, Hindooism, and Christianity, as well as other Eastern faiths. But the sectarianism of the times was too much for his good intentions. If the religions of the period, however, could not be combined, we find that the architecture of that period was the point when the Mahommedan had combined with it, to the greatest extent, all the principal constructive features of the Hindoo. And Akbar's palace at Futtehpore Sicri may be taken as the representative building of this period.

I have submitted to you to-night some sketches of Futtehpore Sicri: one is the Hall of Audience; in it is a very beautiful pillar, covered all over with tracery, with a huge capital formed of a series of Hindoo brackets. On the top Akbar used to sit and administer his affairs. A stone slab serves as a passage to each corner of the building, where sat his four ministers,—one for east, west, north, and south; and they had these districts of Akbar's dominion under their control. You will see that the construction of this building is wholly Hindoo, for there are no arches in it. The roof is of stone, and built in a peculiar way, of which I can give you no other information beyond what is seen in the sketch. All I can say is, that the lines there represent slabs of stone. But there is another roof, of which I submit a sketch: it is of the same period, and belongs to Akbar's palace at Agra. In it you will notice that the roof is formed of slabs of stone; and to get support a bracket is introduced more of the character of a flying buttress, if one might try to express it by that name; for I have never seen a thing of the same character out of India, where it is found in wood as well as stone. It is one of the main features of Bombay street architecture of the present day. I submit a drawing from which you will see this. One of the great features of Futtehpore Sicri is the great gate: it is the largest in India, if not the world: it is built of red and buff sandstone, with white and black marble introduced. My drawing is in rather acute perspective to let the front be well seen. I selected the point as being that best for a picture, as it gave me a large wall and some fine Mahommedan capitals to make a good foreground. Within the



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DETAILS

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| A PILASTERS GROUND FLOOR | C KEY STONE GROUND FLOOR WINDOWS |
| B MAIN CORNICE & CONSOLES | D CAPITAL FROM 3RD FLOOR WINDOWS. |
| E CORNICE & FESTOONS OVER DOORWAY | |



ROBERT DUDLEY, DEL ET LITH

THOMAS HARRIS, ARCHT

MACLURE, MALDONALD & MACGREGOR, LONDON

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GROSVENOR · SQUARE.

gate is the tomb of a Mahomedan saint, called Sheikh Saleem Shisty: this is built of white marble; but the main feature of it in an architectural point of view is the peculiar bracket, the tracery in each bracket being different. This is again Mahomedan decoration on Hindoo construction.

The little that remains of Jehangeer, the son and successor of Akbar, is not much, and it is inferior.

The buildings of Shah Jehan, the next emperor, are, of all Indian architecture, in the most perfect state of preservation; but then they are only about 200 years old. They include part of the fort at Agra, the Jumma Musjid and fort at Delhi, the Mottee Musjid at Agra; but the most renowned of all is the Taj Mahal at Agra. This is composed nearly all of white marble, and inlaid with precious stones. It is in this reign that we get the first introduction of European art: it is only to be found in the ornament, and, perhaps, in a tendency in the mouldings to European models. Of course European workmen were not introduced: all that the native workmen had could only have been the designs of the European architect to work from. This may account for the bad way in which the ornament is produced; for it was a new style, and not properly understood by the workmen; and I should say in addition, that the designs themselves were anything but good; so that the first thing which offends the eye accustomed to good ornamentation is the very bad stuff which is on this much-vaunted building. It is of the most tawdry description. But this applies to every feature of the building, and of all those of the date of Shah Jehan. They show every indication of a fictitious style,—where parts are put up without meaning; where you find that, instead of the production of real beauty, the eye is attempted to be imposed on by pretensions of the lowest kind. European art once introduced, it soon spreads; and we soon find it mixed up with the native, and assuming a character which is, I think, peculiar to India. Lucknow may be taken as the representative specimen of this period; but to call it architecture would be a questionable use of words. If you wanted to produce a caricature of European architecture as it has been since the revival of Classic models, I feel certain that the best efforts would fall far short of the gross caricatures you would already find existing in the metropolis of Oude. As to our efforts in the way of architecture in India, I fear little can be said. We have added the title of the "City of Palaces" to Calcutta; but if the change which is at work at home goes on in our ideas and practice in architecture, I fear the "City of Palaces" will require a new and less high-flown phrase by which to express its real character.

In some of our large stations new churches have been lately built which are a vast improvement on older efforts; and India is now so close to England in point of time, that whatever improvements take place here will soon be indicated there; and I believe that a complete change is taking place for the better among ourselves; and that the day is not far distant when better deeds will be done; and that we will, as a great nation, be able to leave some worthy memorial of our power to the future.

DESCRIPTION OF THE ILLUSTRATIONS.

OCEAN MARINE INSURANCE OFFICES, OLD BROAD-STREET.

PLATES I. & II.

THE building which is represented in these Plates is one of the many magnificent stone edifices with which the city of London is now being adorned. The object in these erections seems to be to secure elegance of design with the utmost facility for business purposes. The outlay of capital is necessarily very great; but in return the proprietors realize enormous rents, and the structures are so solid and substantial, that they are calculated to last for many generations.

In the construction of the Ocean Marine Insurance Offices, the architect, Mr. Bell, seems to have made the most of every inch of the limited space at his disposal, whilst the front is bold, commanding, and ornate. The ornamental details are artistically conceived and well executed. It is, in our estimation, a fine combination of artistic taste and commercial enterprise, and we can only hope that Mr. Bell may have many opportunities of adorning our streets with similar chaste and elegant buildings.

HOUSE AND SHOP, NO. 26, SOUTH AUDLEY-STREET, GROSVENOR-SQUARE.

PLATE III.

THIS building is erected upon a site measuring on the ground-floor 60 feet in depth by an uniform width of 17 feet 6 inches. The street-front is constructed of white, yellow, and red bricks, with tile courses for borders, and some stone and iron work. The design is an original conception of the Architect; and the entire edifice, with all its details, both of the interior and the exterior, is to be regarded as an early exemplification of the principles set forth by the Architect in his pamphlet entitled "Victorian Architecture." It must be added, that, in consequence of the outlay being restricted within fixed limits, simplicity of treatment was necessary: accordingly, the Architect states that it was his aim, as far as possible, to "make the construction the vehicle of ornamentation, by which means much expense might be saved, a novelty of effect might be produced, and all shams avoided."

In addition to the domestic offices, the basement contains a spacious ware-room. The ground-floor consists of a shop, a chemist's, in height 9 feet 9 inches, a lavatory, a private consulting-room, two store-rooms, the staircase, and a corridor leading to the dining-room, 17 feet 6 inches by 13 feet, which is at the back of all, and is lighted from above. The mezzanine-floor, in height 7 feet 6 inches, comprises a morning-room and two bed-rooms. Above these rooms is the drawing-room, 20 feet by 17 feet 6 inches, and 11 feet high; also a lobby, from which the upper staircase ascends, and a nursery at the back. The next floor contains three bed-rooms, 9 feet high, with a house-maid's closet. Over all these are a spacious attic and a large lumber-loft, having a door of exit to the adjoining flat. There are also, in a wing building, two other bed-rooms.

The shop-front has a recessed central entrance with folding doors between two large windows. On the level of the shop-ceiling the entire front of the building is carried upon a wrought-iron plate girder, resting at each end upon a stone pier, assisted by the two iron pillars which divide the front into three bays. The piers are constructed of Bath stone, and are carried up above the girder, where they are weathered off to the front wall: but the iron pillars stand upon Portland stone plinths in the recessed doorway, having screwed to them vertically angle-fillets of iron, to which the door-frame and window-sashes are fixed without any casing or boxing. The doors which, with all the wood-work of the shop-front, are of polished mahogany fitted with plate-glass, are hung on swinging hinges. Iron shutters, an awning, and a gutter connected with lateral down-pipes, are introduced into the composition, and they render the shop-front complete, while their arrangement enhances its general effectiveness. The area is protected by decorative iron-work. The girder, the columns, and other parts of the iron-work are painted dark blue relieved by gilding; the area-railing, &c., are bronze green; and the shutters are japanned of a russet colour.

Below the central window of the mezzanine-floor, and in the spandrels of its arched light, are openings for ventilation. The arrangement of the three windows which light this floor, and the decorative

construction, are clearly shown in the lithograph, Plate III. The same may be said of the two large windows that light the drawing-room, with their boldly projecting stone balcony and its iron railing. It will be observed that the piers of these windows have a projection from the plane of the front of $4\frac{1}{2}$ inches, in order to give greater space for the inside shutters, and thus to avoid the necessity for boxings in the room. The horse-shoe arches of the windows are constructed of moulded bricks, enclosing sunk stone slabs decorated with carved trefoil panels. The triangular aperture between these two window-arches is for ventilation. The two upper windows are of brickwork, with stone lintels over their central compartments, the whole being surmounted by interlacing arches with two iron ventilators. The projecting stonework of the parapet is carried by courses of brick dog-tooth and cut ridging tiles. The roof, which is curbed in front and covered with slates, is pierced by a splayed dormer-window. The chimney-stack is of coloured bricks with stone cappings. The down rain-pipe, painted light blue with russet clips, is carried down one side of the front. The lower balcony is also light blue. The upper balcony ironwork is bronze green, with russet top rail, and the sashes and frames of the windows are wainscot in two tints, the putties being light blue.

In the interior, the ceiling of the shop exhibits the moulded wood work of its framing, and both the constructive details and the fittings of every kind are rendered in keeping with the general design. The same originality of treatment, combined with careful attention to the consistent adaptation of the several details to their appropriate duties, prevails throughout every apartment, and the shop and the several rooms appear very happily suited to the purposes for which they have been constructed. We desire to notice, as deserving particular commendation, the doors, window-frames, and other interior woodwork, which are executed in the most satisfactory manner in varnished deal.

The Architect was Thomas Harris, Esq., of Charles-street, Berkeley-square, and the works were executed by Mr. John Hall, of Queen Anne-street, London. The total cost did not exceed 1800*l*.

TERMINUS HOTEL, LONDON BRIDGE.

PLATE IV.

IN this plate we give a simple view of the upper part of the south-east angle of the London Bridge Hotel, and also some details of the interior decorations of the Coffee Room. This is one of the most magnificent rooms in London, but we must defer a full description of the building until a future number, when we shall devote a paper to the Railway Hotels of London.

THE LATE MR. L'ESTRANGE, OF HUNSTANTON HALL, NORFOLK.

ON Monday, the 4th of August, the grave closed over the remains of one of the most accomplished amateur artists of the day—a wealthy country gentleman of knightly and even noble family, who had earned no inconsiderable reputation in artistic and ecclesiastical circles for the zeal and ability with which he had set himself to utilize his undoubted talents in a manner which specially commended itself to his thoroughly religious disposition. It is sad to think that so noble-hearted a man should be so prematurely cut off in the midst of a career which was yearly becoming more and more distinguished. Mr. Butterfield's brief letter in the *Guardian* about him is so vague and insufficient, that a larger notice may not be unacceptable to the readers of this periodical.

Henry L'Estrange Styleman L'Estrange, of Hunstanton and Snettisham, Norfolk, at one time co-heir to the Baronies of Hastings and Camoys, was born on the 25th of January, 1815, and was the only son of Mr. Henry Styleman, of Snettisham, by his second wife, Emilia, daughter of Mr. Benjamin Preedy, of St. Albans. He was educated at Eton school, and graduated B.A. of Christchurch, Oxford, in 1836 (when he took a fourth class in mathematics), proceeding M.A. in 1839. In 1839 he resumed the old family name of L'Estrange, and (July 25th) married Jamesina Joyce Ellen, daughter of Mr. J. Stewart, of Belladrum, Inverness-shire, by whom he leaves a family. His eldest son, Hamon, now of Hunstanton, born November 25th, 1840, was educated at Eton and Christchurch, Oxford, graduating B.A. in 1861.

Mr. L'Estrange was a Conservative and a High Churchman. With politics he rarely meddled, but into the Church movement of the last thirty years he threw himself with characteristic heartiness and fervour; at the same time he was thoroughly loyal to the Church, as

became an honourable English gentleman, and set his face steadily against all Romanizing tendencies. Painting and architecture were his delight from an early age, and Christian art was his chief occupation till his premature death on the 27th of July. He knew thoroughly, and had patiently and accurately copied, the noble religious pictures in the British Museum and other collections; chiefly devoting his admiration to the scriptural works of the eleventh and two following centuries. Practically, Mr. L'Estrange was one of the ablest and most successful of amateur ecclesiastical artists. Did ever any one hear of a Norfolk squire, with a heavy rent-roll, in the prime of life, blessed with a family and everything that could make squirearchical existence enjoyable, leaving his country seat and perching himself up in working-man's dress under a cathedral ceiling, to embellish it for God's honour and glory? Yet Mr. L'Estrange did this. Though he was not connected with Cambridgeshire, being a Norfolk man; though he had nothing to do with Cambridge University, being an Oxford man, he devoted his time and talents for a long period to the painting, with his own hands, of the ceiling of the tower and a considerable portion of the nave in Ely Cathedral. The paintings on the Tower represent the Creation; those of the nave, the Genealogy of our Lord. The ablest artists of the day speak with delight of them. Of late, Mr. L'Estrange had been engaged on ten uncoloured full-sized cartoons for the east wall of the new church of St. Alban, Baldwin's Gardens, Holborn, built at the cost of Mr. J. G. Hubbard, M.P. These cartoons represent passages in the life and ministry of our blessed Lord, from the Annunciation to the Day of Pentecost. They would have been painted on the wall by Mr. L'Estrange himself, had not a premature and terribly sudden death taken him from us, at the early age of forty-seven. Not very long ago the Government appointed him, with Sir Coutts Lindsay and others, a member of the Commission for inquiring into the state of the frescoes of the Houses of Parliament.

A few words on the genealogy of this noble-hearted gentleman may fitly conclude this notice. Sir W. Dugdale, in his "*Baronage of England*," says that at a great joust or tournament, held at Castle Peverel, in the Peak of Derbyshire, between Owen, Prince of Wales, and the son of the King of Scots, the two sons of the Duke of Bre-taign were present; on the younger of whom, Guy, was conferred the surname of L'Estrange (the foreigner). On the partition of the estates of Hugh de Albin, Earl of Arundel, in 1243, Joan L'Estrange, daughter of Nicolai de Somerie, second sister of the last Earl, took Hunstanton. For generations the house of L'Estrange was a knightly one; and at length a Sir Nicholas, of Hunstanton, was created a baronet on the 1st of June, 1629. The eldest daughter (Armene) of the third baronet married Mr. Nicholas Styleman; and the mother of this lady, Ann Wodehouse, was descended on the father's side (through the Brothertons, Mowbrays, and Howards, Dukes of Norfolk) from Edward I., King of England, by his second wife, Margaret, daughter of Philip III., King of France. Up to 1839 and 1841, the late Mr. L'Estrange was co-heir of the ancient baronies of Camoys and Hastings, now called out of abeyance.

C. B. B.

PETROLEUM—OIL WELLS OF SMITH'S FERRY—ALLEGHANY OIL BOATS.

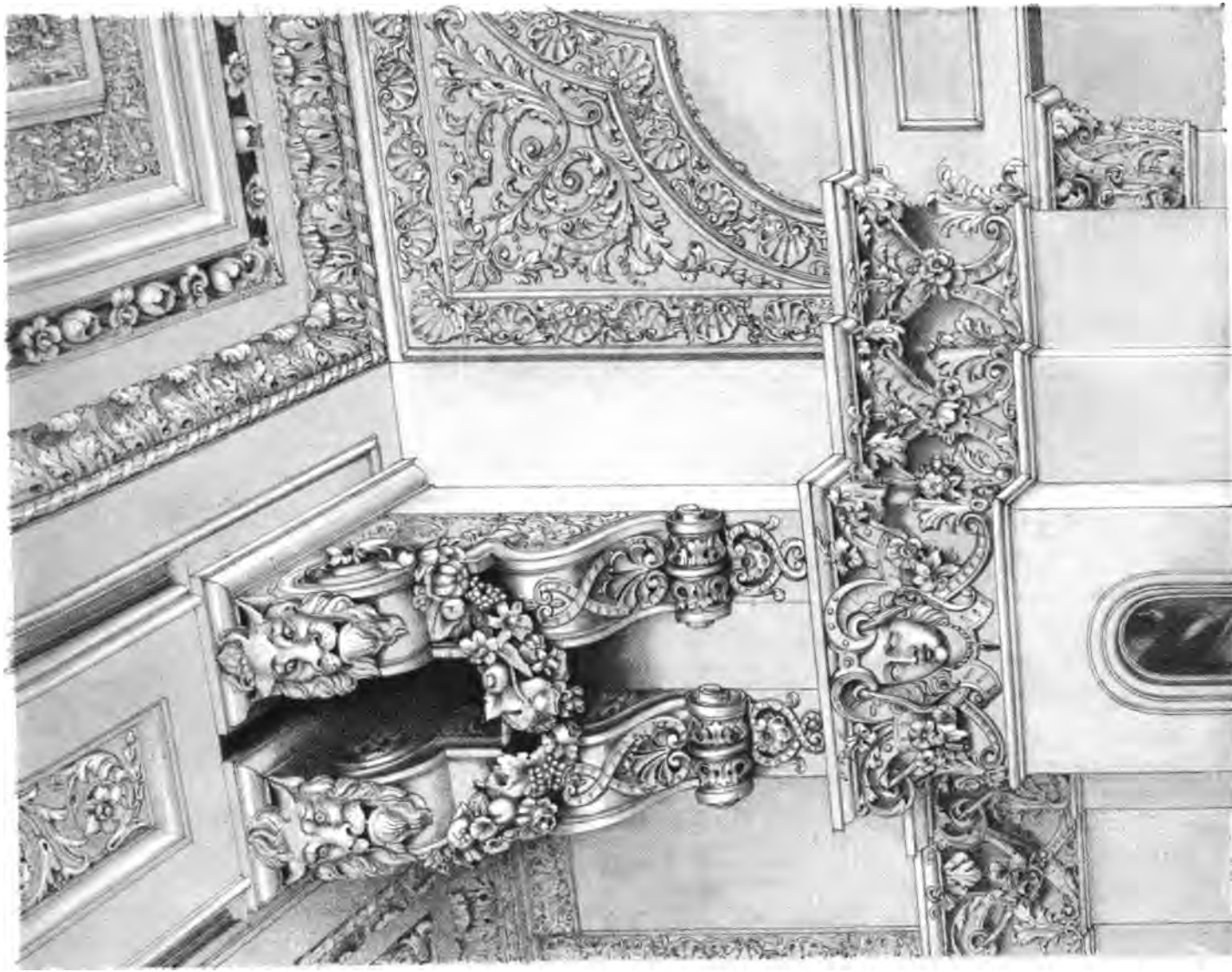
(From the "*Scientific American*.")

A NEW branch of national industry has sprung up within the past two years, which promises to become both great and profitable—we mean that of petroleum, or rock oil. The export trade in this substance has already attained to vast dimensions. From the 1st of January last to the 23rd of June, no less than 2,961,317 gallons were exported from New York; 1,095,826 from Philadelphia; 190,512 from Boston, and 36,530 from Baltimore, making a total of 4,284,185 gallons. These native oils were forwarded to almost every country on the face of the globe, but England is our best single customer, as about 2,000,000 gallons were sent to British ports. One merchant in Liverpool, who has imported largely, states that Great Britain alone can absorb 1,000,000 barrels (42,000,000 gallons) per annum. When we reflect that this business is but in its infancy, the large quantity which has already been exported is perfectly surprising. It is believed that the United States and Canada possess natural supplies of petroleum to furnish the rest of the world for ages to come, with sufficient quantities of oil to yield all the artificial light required, and perhaps much of the fuel also—as it can, and will, undoubtedly, yet be much used for the latter purpose.



ROBERT DUDLEY, DEL. ET LITH.

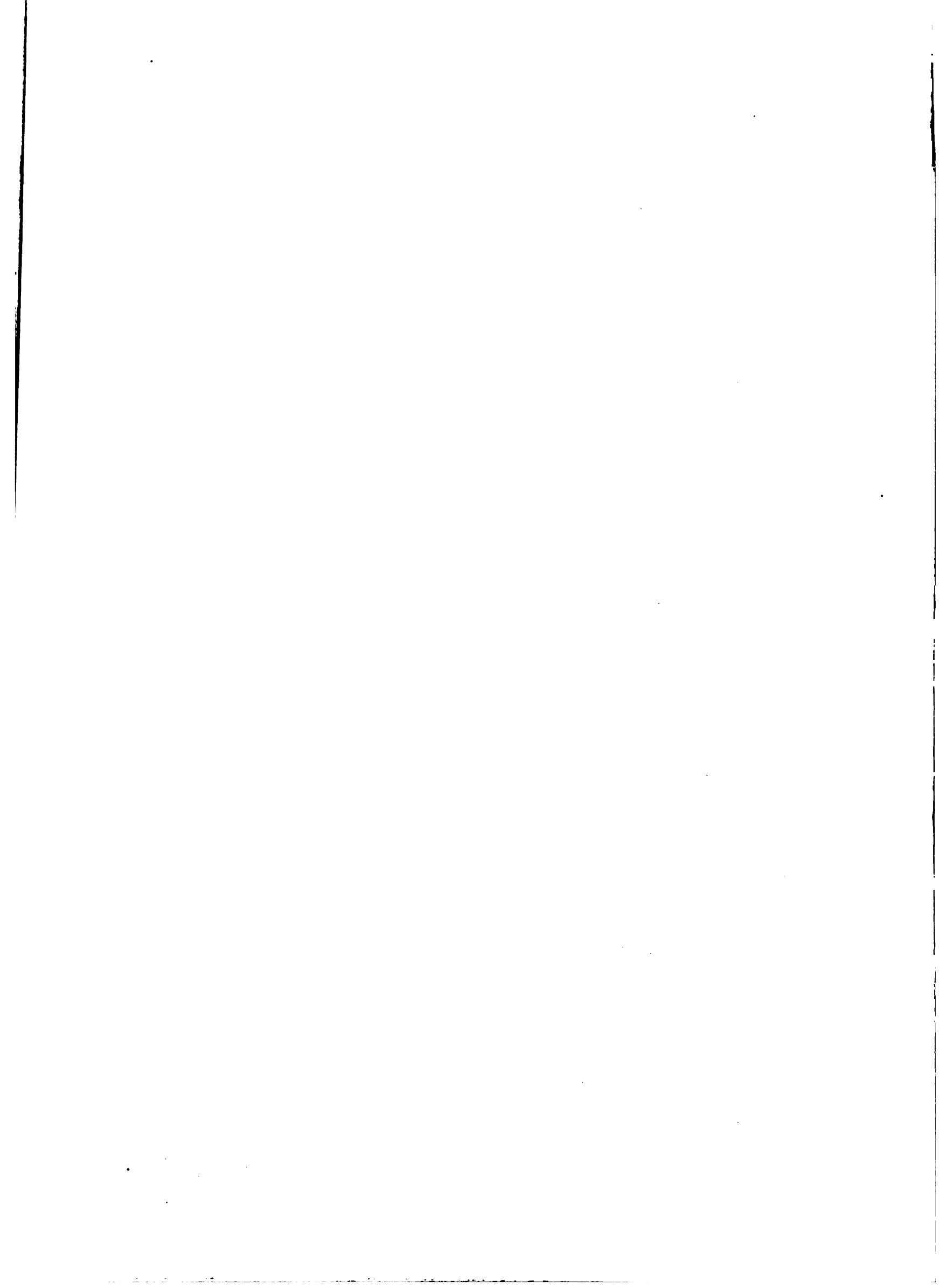
TERMINUS, HOTEL LONDON BRIDGE.
UPPER PART OF SOUTH EAST ANGLE OF BUILDING.



HENRY CURREY, ARCHT.

VINCENT PROGRES, 1887.

TERMINUS, HOTEL LONDON BRIDGE.
INTERIOR DECORATIONS—COFFEE ROOM.



The petroleum region embraces a vast extent of our continent. It is known to extend from the southern extremity of the Ohio valley north to the Georgian Bay in Canada West, and from the Alleghanies east in Pennsylvania to the western limits of the bituminous coal fields. It has been found in Virginia, Maryland, Pennsylvania, New York, Ohio, Michigan, Kentucky, Tennessee, Kansas, Illinois, Texas, and in California. Oil wells, however, have been sunk in but a few localities as yet, and in some of these the original wells have been abandoned, on account of new and more copious supplies being obtained at less expense in other sections. In proceeding up the banks of the Ohio river, a derrick about 12 ft. in height, and a small shanty beside it, with a rusty stove-pipe stuck in its roof, is occasionally noticed. These are deserted pumping oil wells, and at Smith's Ferry, about forty-one miles below Pittsburgh, there is a whole cluster of such wells, all stopped but two. The pumping apparatus of each is very simple. It consists of a small horizontal engine connected by its pitman to a crank, which gives motion to a vibrating wooden beam, one end of which is attached to the vertical pump-rod in the well, which thereby receives a reciprocating motion that operates the pump-plunger and lifts the oil. A rude derrick, a rough shanty, a small steam-engine, a pump, a few barrels and tubs, constitute the apparatus and utensils required for operating any of these oil wells. Such wells may be seen on both sides of the Ohio and Alleghany rivers, and occasionally on some of the little islands. They were mostly sunk before the flowing deep petroleum wells in the Oil Creek region, Pennsylvania, were discovered. Bore anywhere adjacent to the Ohio river for a few hundred feet, and earth oil is reached. We have noticed a coat of this oil covering the surface of the river for a distance of seventy miles. When the sunbeams shine upon the ripples, it reflects the prismatic hues in beautiful green, crimson, and orange. It no doubt assists to lubricate the bottoms of the quaint-looking flat boats which run on the Alleghany, Monongahela, and the Ohio rivers. The pumping wells are generally suspended at present, because the oil cannot be raised from them by steam power so cheaply as it can be obtained from flowing wells. But the oil obtained from the pumping wells at Smith's Ferry is of no common quality. It is almost as clear as refined petroleum, and it can be burned in lamps exactly as it is raised from the well. We have seen a mixture of one half of this oil and an equal quantity of crude petroleum burn very well in a lamp. It resembled common whale oil. It is heavier than the refined petroleum, and is safe to carry and use. Only a few barrels per day, however, are obtained from single wells, or perhaps they might be operated with profit.

The petroleum wharf at Pittsburgh, on the Alleghany river, is a greasy sight of an uncommon character. It is covered for half a mile with barrels of petroleum that have come down the river in boats from the Oil Creek region. A large number of flat boats are also generally lying at the wharf, some of which are discharging their green oily cargoes. These vessels are queer-looking structures, being simply large boxes made of plank, and divided into cells forming tanks, which are made as tight as practicable. They are filled at the oil wells, then closed, and about from twelve to twenty of them are formed into a fleet and floated down the Alleghany river. Some boats carry the petroleum in barrels, but a large number are simply floating oil-boxes. This part of Pittsburgh is redolent with the exquisite odour of Pennsylvanian subterranean Eau de Cologne. Refined petroleum may be obtained in Pittsburgh in large quantities for sixteen cents and upwards per gallon. This burning fluid affords the cheapest known artificial light, and its use has spread from Maine to California, and it is now almost exclusively burned away up in the Lake Superior regions. While it can be obtained at such low prices, it will be used as an agent of artificial illumination to the exclusion of all the more expensive agents of light, with the exception of coal-gas.

Different opinions exist respecting the source of petroleum. Prof. Silliman states that it is of vegetable origin, and was produced by the agency of subterranean heat. This is a very general but unsatisfactory opinion. Geologists most generally believe it to be derived from bituminous shales situated below the coal formations. It is commonly found in the American rocks called the Portage and Chemung Group. This group of rocks is of immense thickness on some parts of our continent, being no less than 4900 feet thick in Michigan. The bituminous shales called Utica Shales have yielded large quantities of oil in Canada by distillation, and the spouting petroleum wells of Enniskillen are in this formation. But petroleum is not always found in this class of rocks, as no oil has been found in various parts of New York State, where these rocks have been bored to a great depth.

Many practical men in the Alleghany and Ohio valleys believe that

petroleum has its origin in coal beds. They assert that a low heat in the coal seams drives off hydrocarbon vapour, which is condensed in the pores of the rocks and the soil, and is washed by rains into subterranean recesses, situated at various depths in the rocky strata. Coal is found in all the hills adjacent to the petroleum wells in Pennsylvania, Ohio, and Virginia. Cannel coal is abundant in the hills within one mile of Oil Creek, Pa. Is it not reasonable to suppose that reservoirs of petroleum must be situated at a considerable height above the level of the ground where all the overflowing wells are pouring out their oily fluids? In all artesian wells the water rises to the height of the fountain head, and the same law must prevail in petroleum wells. May not the reservoirs of the petroleum spouting wells be situated far above the level of the rocks where the oil is tapped in boring? The proprietor of a petroleum well near Parkersburg, Va., has assured us that the oil obtained in his well is of the very same character as that derived from the coal in its vicinity by distillation. It is a heavy oil, more unctuous than the common petroleum of Pennsylvania, and it is chiefly used for lubricating machinery. It is well known that oil of different qualities is obtained from different coal beds, and the petroleum of the United States differs in several characteristics from that of Canada.

Facts would appear to favour the theory that petroleum wells have two sources of supply—namely, coal beds and bituminous shales. In western Pennsylvania, Ohio, Michigan, Virginia, and Kentucky, petroleum is usually found in the vicinity of coal seams, and it was a petroleum well in England, situated close to a coal bed, which suggested to James Young the idea of distilling coal at a low heat and obtaining oil therefrom. The commercial success of his efforts led to the very extended use of such oil, and finally to the very general application of petroleum for light.

This much may be accepted in favour of coal beds in certain localities being the sources of petroleum. On the other hand, petroleum wells are found in Italy, Sicily, Syria, the Crimea, Persia, Siberia, and Canada, very far removed from coal beds, but where there are bituminous shales, and this kind of petroleum differs frequently in several essential features from that which is found in coal regions. The Canadian crude petroleum far surpasses that of Pennsylvania for concentrated stench, and we can easily credit it with a lower, older, and different origin.

Geologists who adhere to the idea that bituminous shales are exclusively the source of petroleum, will be pleased to make a distinction between the source of the decent, clear oil obtained at Smith's Ferry, on the Ohio river, and that found north of the upper lakes. But whatever may be the source of petroleum, and whatever theory may be the most plausible, it must be admitted that we are unacquainted with most of the operations of nature in the interior of the earth. The most important question is, Will not our present sources of petroleum soon become exhausted? In answer to this, it may be stated that petroleum springs have been known, and the petroleum used to some extent, for thousands of years. Thus, in the island of Zante, in the Mediterranean, there are two springs which have been open many thousand years, and the more rapidly the substance is removed from the wells, the more powerful and prolific the springs become. If this has been the case with the petroleum springs of Zante, may it not be so with those on our continent?

Petroleum, or rock oil, may not always be a proper name for this peculiar substance. It is found in swamps and peat bogs as well as rocky strata. In the swampy forests of Borneo the Dyaks collect petroleum from the surface of ponds, but all the flowing wells in America have been sunk to a considerable depth in rocky strata.

THE AGE OF ENGLISH TREES.

Oaks and yews, the most venerable of our trees, are, in several instances, so old, that it is difficult to form an estimate of the time which has passed since they were planted. Several oaks felled in Sherwood Forest, about a quarter of a century ago, exposed, on being sawn up, the date 1212, and the mark or cipher of King John; and it has been calculated that these trees must have been several centuries old at the time the marks were made. It is well known that the oak which is said to have proved fatal

To that red king, who, while of yore
Thro' Bolder-wood the chase he led,
By his loved huntsman's arrow bled,

was standing, not long since, in the New Forest, in Hampshire: they

who think this tree insufficient to record a fact of so ancient a date should be reminded that Sir Thomas Dick Lauder says, "Seven hundred years make no extraordinary period in the existence of an oak: some oaks blown down in Donnington Park were supposed by the interior rings to have been nearly 800 years old; and it is supposed, on good authority, that there still exist in England oaks which were in existence at the commencement of the Christian era." A venerable oak stood not long since at Tormond Wood, in Stirlingshire, under which, tradition says, William Wallace convened his followers. There are vestiges of the ancient Druids in the neighbourhood of this tree, which was 22 feet in circumference. There is another famous Scotch oak called the Wallace Oak, at Elderslie, near the place where Wallace was born. There are other oaks in Great Britain which are probably more than 1000 years old. The most useful age of this tree, for building and other purposes, is from about 50 to 70 years.

The oldest known elm is said to have been that at Checquers, Buckinghamshire, and is supposed to have been planted in the reign of King Stephen. The elm does not seem to live so long in the vicinity of towns as in the pure country air. Queen Elizabeth is said to have planted an elm with her own hands at Chelsea: this was felled in 1745, and sold for a mere trifle. There are some fine trees of this kind in St. James's Park and Hyde Park; many of them have within the last dozen years suffered much by decay, storms of wind, &c. One of the elms planted by Sir Francis Bacon, in the year 1600, in Gray's Inn, was felled in 1725, in consequence of its commencing to decay: it was then more than 28 feet 6 inches in circumference near the root. The elms in the vicinity of the metropolis are much worm-eaten.

The mulberry seems to have been chiefly introduced into England by King James I., who was anxious to establish the culture of silk in this country. The king caused 10,000 mulberry plants to be purchased and distributed throughout the country. They were delivered in London at the rate of three farthings each. The mulberry-tree said to have been planted by Shakspeare, in New Place, was felled by the Rev. Francis Gastrell in 1756. Not longer than fifteen or sixteen years ago there were both mulberry-trees and vines growing on the spot which had been used as the garden of the Priory of St. Bartholomew the Great, Smithfield.

The horse-chestnut is a native of Northern Asia. Thence it was brought to Constantinople, Vienna, Paris; and it was in the year 1712 first introduced into England. This tree is of very quick growth. Plants which have been raised from the nuts have grown to a large size in twelve or fifteen years.

In the days gone by, before fire-arms had put out of fashion the use of the bow, the culture of the yew was an important matter; but the growth of this tree was very slow, and the demand for wood of a tough, durable, and elastic nature, for bows, was so great, that the home supply of yew wood was found insufficient; and merchants were for a long time obliged by law to import four staves with every ton of goods coming from places where bow-staves could be brought, and ten staves with every butt of Malmsey from Venice. When we consider the very slow growth of the yew, and the large size to which some still in existence have grown, it seems probable that their age is not less than that of some of the famous British oaks. Many have been recorded of the circumference of 26 feet, and there are some even larger than this. In Fotheringale churchyard, in Perthshire, is an old yew, much shattered, and nearly dead, the trunk of which measures 56 feet 6 inches in circumference.

There are in England about fifty varieties of the willow, all of them of rapid growth. The famous weeping willow planted by Pope came from Spain, inclosing a present from Lady Suffolk. When the covering was taken off, the poet observed that the pieces of stick appeared as if they had some vegetation. Under the idea that it might perhaps produce something which we have not in England, he planted one in his garden, and it produced the willow-tree which gave birth to so many others. So rapid is the growth of this tree, that we have noticed several which have become of large size in about fifteen or twenty years from the time at which they were planted.

The Scotch fir, the silver fir, the Norway spruce fir—which was first brought to England upwards of a century ago,—the pine, in its various and picturesque forms, are all of rapid growth, and have, by the extent to which they have been planted, added much to the beauty of many parts of England.

The beautiful beech—which in point of size follows next to the oak and ash, and is found in great perfection in many parts of this country—is useful in the arts and manufactures: the wood is fine and durable, and is the best of any for turning, making toys, wheel-

wrights' machinery, cabinet-makers' articles, Tunbridge ware, the piles for the foundations of bridges and other buildings: and, throughout the rural districts, the

Beech makes their chests, their beds, and their joined stools:
Beech makes the board, the platters, and the bowls.

The hazel, if allowed time to grow, will yield poles 20 feet and upwards in length, which would be useful for various purposes. The tough bending ash gives to the peasant part of the material for his plough, and to the prince important portions of the carriage in which he rides: wheels, palisades, hop-poles, tool-handles, walking-sticks, ladders, carts, and a hundred other articles of every-day use, are made of the wood of this tree.

The thin twigs of the birch were formerly, in connexion with education, more familiar to school-boys than they are at present. The wood of this tree is, however, useful in many other ways. In those parts of the Highlands of Scotland where pine is not to be had, the birch is the timber used for many purposes. The stronger stems are the rafters of the cabin: wattles of the boughs are the walls and the doors: even chests and boxes are made of it with rude workmanship. With the Highlander it often forms his spade, his plough, cart, and even for the harness, cordage is twisted with the small sprigs.

The maple, or sycamore, often grows to a large size; one at Knowle, in Kent, was 12 or 14 feet in girth. The original plantations of Vauxhall and Mary-le-Bone Gardens were chiefly of the great maple. It is not considered to live to a great age; yet some have been noticed at Cambridge in a flourishing state at the age of 185 years. Before the use of crockery became so general as it is at present, the wood of the maple-tree was common material for bowls and platters. It does not readily warp or splinter: it is therefore employed in making saddle-trees, founders' patterns, &c.

The common holly, at full growth, is generally from 20 to 30 feet high; but it has been seen of the extraordinary height of 60 feet. The timber of the holly is very white and compact; it, however, retains the sap, and takes a long time to season. The growth of this tree is very slow; it can be used in the manufacture of what is called Tunbridge ware; for some common kinds of engraving, instead of pear-tree, or box-wood; and, dyed black, it is at times worked by cabinet-makers instead of ebony.

There are several varieties of the lime which seem to stand the smoke, &c., of cities better than other tall-growing trees. It is said that the two first lime-trees which were planted in England (1590) are still growing at Halstead, in Kent. There is, however, much difference of opinion respecting the time of the introduction of this tree. This wood is much used by mould and other carvers. Gibbons, in the time of Charles II., decorated various important buildings with it. Many lime-trees are more than a century old.

The walnut-tree grows rapidly in England. There is a record of one of these trees growing in Scotland in the year 1684. It was more valuable before the extensive introduction of mahogany and other foreign woods than it is now. During the French war, the great demand for musket and pistol stocks thinned the walnut-trees in this country. At that time so great was the demand for this timber, that a large sound tree has often been sold for 600*l.*, when cut into gun-stocks. The hawthorn is quick-growing when young; but when left to stand till it becomes a tree, it makes wood very slowly, and lives to a great age. The plane-tree was first introduced into England in 1623.

The cypress grows to a great age, and, in some cases, to an immense size. It is recorded that one grew in Persia which was supposed to be two thousand five hundred years old. The cypress is one of the most durable of woods.

The crab-apple, pear, and cherry-tree afford closely-grained woods, which are used in several ways, as is the box-wood which grows in England.—*Builder.*

NEW MATERIAL FOR PAVEMENT.—In the Rue Druot, a street opposite the Rue Richelieu, on the Boulevard des Italiens, a powder, of the colour of ground coffee, and smoking hot, is spread down and then beaten, not violently, with a smooth flat iron at the end of a handle. Over the surface so formed a large iron is run by a man so as to remove all inequalities. In a few minutes, it is said, there is a hard substance resembling asphalt.

NEW ENGLISH CHURCH IN PARIS.—A new English church is being built in that part of the Rue Roquépine which is prolonged to the Boulevard Malesherbes.

THE ORCADIAN BARROW AT MAES-HOWE.

THE interest with which the cell and the runes at Maes-Howe were regarded will be in the recollection of our readers. The runes have now been translated; and Mr. Farrer, the senior member for South Durham, has just got printed for private circulation a "Notice" of the inscriptions. He had casts taken and drawings made with the greatest care and fidelity; and they were all submitted by him to some of the most celebrated Runic scholars of the age—Professors Rafn, Stephens, and Munch. The result of their examinations (translations) is given in the notice referred to. The origin of Maes-Howe is, of course, most obscure; but it is, nevertheless, alluded to in the inscriptions, which, as was known, were less ancient in origin. "This barrow," says one of the Runes, "was formerly a sorcery hall, erected for Lodbrok: her sons were brave; such were men as they were for themselves (such we may call valiant men, such as they were in their achievements). The Iorsalafarar (visitors of Jerusalem) broke open Orkhow . . . Earls. To the north-west a great treasure has been hid (but few believe that). A great treasure was hid here. Simon Sigr (victor) carved (the runes) and afterwards Juge. Happy he who may discover this great wealth. Ogdonaegh carried away the goods from this barrow."

"A sorcery hall" was precisely what we anticipated that the Maes-Howe cell would turn out to have been. Who "Lodbrok" was does not appear; but just as the cell at the New Grange barrow, in Ireland, was "dedicated to the Great Mother Ops," whose "house" it contained side by side with "the tomb of the hero" who had undergone all the trials of initiation; so, probably, Lodbrok was the "goddess," or "great mother," to whom the "sorcery hall" of Maes-Howe was "dedicated" or "erected." This sorcery hall also reminds one of the mystic "hall of Ceredwyn," or the Great Mother Ceres, and of "the narrow bed beneath the tumulus," in which the Druidical hero, the Taliesin, was "made perfect." The New Grange tumulus, or "pyramid," as it has been also called, is said to be the very portrait of one described by Pausanias at Mycenæ in the Peloponnesus. We also find a close similitude of its internal arrangements, comprising "the house of the god" and "the tomb of the hero," in "the Dwarf [or Pictish?] stone" of Hoy, in Orkney itself. This stone is a hollowed monolith, 36 feet long, 18 feet broad, and 9 feet high. At each end is a bed and pillow, worked out in the stone; and at the top is a round hole, probably for ventilation. The entrance is a hole 2 feet square, into which a square stone, still, or at least some years since, extant, could be fitted by way of a door. Herodotus describes just such another near Minerva's Temple at Sais, in Egypt.

Thus universal do those mysterious religious initiations seem to have been which comprise, in their requisite arrangements, such cells as those of Maes-Howe and Hoy, in Orkney; New Grange, in Ireland; Sais, and the Great Pyramid itself, in Egypt; Mycenæ, in the Peloponnesus; and many others in widely-different parts of the world.

The encyclopædic and compendious Higgins, in alluding to some of these cells, says, "It seems not improbable that these stones may have been for the same religious purpose; but *what that may be*, or whether Druidical or not, *no one can say*." However, there is good reason to believe that such cells, or "narrow beds" and "sorcery halls," were used for religious or magical initiations and enchantments; in which entrancement, and the god-possession of the entranced, were the primary objects in view; the responses given to those who "inquired" of the Spirit which was evoked in the entranced constituting "the oracles" of the heathen. To this day there is a tribe in the Himalayas who, according to Hodgson and other writers in the "Transactions of the Asiatic Society," are in the habitual practice of entrancing a priest called "the Deoda," whom they then consult as an oracle, in a pavilion, or cell, constructed for the occasion. Among the American medicine-men, or thaumaturgical priest-physicians, and various other more or less savage and semi-civilized tribes of men, the Buddhists of Thibet inclusive, similar practices are also still adopted; as, indeed, they are well known to have been in the temples generally of the ancient heathen.

At the weekly meeting of the Commissioners of Sewers, held on Tuesday last, at Guildhall, Mr. de Jersey in the chair, Dr. Letheby, the medical officer of health, reported on the state of 349 houses that had been inspected during the last fortnight, and he submitted a list of 75 places for sanitary improvement. He likewise reported that the markets and slaughter-houses had been duly inspected, and that the officers had seized 5915 lbs. of meat as unfit for human food.

SIGNS OF PROGRESS.

STRANGE it is, that after all that has been written, all that is before our eyes, there should still be any who can doubt of our advancement in this century. "An age that has fallen to such a bathos of ignominy!" Strong language. Mark the writer's ire, and assist him to express his contempt for an age that produces its carpets by machinery! I confess I expected the word "sausages," and my fear subsides when it is only carpets. Yet such do exist! and this is my apology for bringing a few well-known facts again before the intelligent reader. First and greatest, as "knowledge is power," are the improvements in the art of printing, the price of books and journals, produced by the steam-engine, or the presses and machinery produced by such; when the poorest man may store his mind with knowledge or entertainment; where his soul receives the breath of the master-mind, purifying its dross as fire purifies metal. What intellectual recreation had the artisan of the fifteenth century? when "there were very few chimneys even in capital towns: the fire was laid to the wall, and the smoke issued out at the roof, or door, or window. The houses were wattled and plastered over with clay, and all the furniture and utensils were of wood." In the writings of the immortal Shakspeare, words and sentiments appear which would scarcely pass in the literature of our day. And many examples still remaining speak for themselves, bearing testimony neither to the plenitude of the article, nor the honesty of the people, when the Bibles were chained in the churches.

The lectures, classes, and museums,—all fruits of this peculiar age, all tending to make the intellectual predominate over the animal, the godlike over the brute,—all giving increased power of research, increased appetite for it, must be remembered. Then the mammoth of the time, the birth of the age, under Providence, the producer of our advancement and comforts, the comforts of the artisan, that gives him his "carpets" at all; and he would have an unenviable spirit who could grudge him this or any of his comforts,—would deny his *railway* ride to rural scenes, where he may enjoy the free breath of heaven as a relaxation to his daily work. That has been as a reservoir of good to the man of science, crying aloud, Persevere in your research, that further discoveries may be yours, that further blessings be showered on your fellow-man! This brought into the regions of possibility the present International Exhibition; and the advent of such an event, in the day-dreams of the art-worker of the last century, may have seemed as impossible as that of a new style of architecture to many now seems; and he who asserts that the present or late gathering of the art and industrial produce of the nations is unfavourable to progress, and is not evidence of the advancement of the age, requires being put under restraint. "And to what a state of imbecility is the man reduced that has to set the steam-engine a-going!" George Stephenson, for instance. And the public will judge whether they are better served by men who travel by cold winter nights, by burning suns, by drenching rains, and amidst the electric war of the elements, holding our lives by hundreds in their hands—or by the London cabmen?

"Are your men any happier or nearer heaven?"

THE SPIRIT OF MODERN WORK.

ALL good work in the present day must be a protest against the triviality, money-worship, and machine regularity of our time. It does not follow that such should be the spirit of work in another age; but in ours it is plain that art must fight the ease, elegance, and sensuality of modern society, because in themselves they are detestable traits of character. Designers are now chiefly occupied in drawing patterns for articles to be made by machinery—not a very noble occupation for human minds; and their designs never can be anything but geometrical patterns or symmetrical foliage—also not a lively prospect. Now, surely a wall with a flight of birds painted on it, and half a dozen of them having a good fight in the Japanese manner, is more interesting and contains more life than a million diapers. But this work cannot be done by machinery: you cannot throw life into anything made by machinery: a hanging or carpet, with some violent grotesque dragons, animals, fish, doing something, not in a state of modern lethargy, is more amusing than the incipient, chilling, flat patterns one is treated to now. The spirit of Japanese work is right—full of life, vigorous and severe. I cannot see anything approaching this in modern English machine patterns: we must either put up with

cold mediocrity of design, or else restore handwork. Modern furniture is full of every type of sensuality! there is no severity about it: the woodwork, without any reference to construction, is twisted into shapes for sensual posture: to avoid this, woodwork ought to be rigidly straight, and the cushions cut and made into the shapes you require for ease, but not the framework. However, no material shows the effect of modern old-maidish trimness, or of measured exactness, like our painted glass windows: here the surface is covered in now with French conventional foliage, as stiff and unmeaning as possible. What do you want in a glass window? An intelligible picture, of brilliant gemlike colours, with the background filled in with any quantity of bits of glass to make up a noble mass of colour. Now, I ask, what can be the use of filling in such spaces with black lines representing foliage? You do not want black lines: you want colour. What can be the use of drawing a stiff border? Surely a lot of bits of glass, put in indiscriminately, will ensure more effect; and the glass must not be too even in colour: it is the unevenness of tone of old glass, and of oriental textile fabrics, that gives them such lifelike effect. If at the Exhibition, I would call on your readers to notice the difference between the glass of good and bad design. The latter is mathematically cold and accurate; all over foliage drawn in black lines and finicky borders: the former has a noble pictorial mosaic design; which, were the glass better, would be of splendid colour; but this is no fault of the designer: the back is filled in with rough irregular glass, bits of diapers—anything, in fact, to get the desired effect of breadth of rich colour; but throughout the whole there is an absence of useless labour and finicky patterns, and no sign of that disgusting geometrical regularity in arrangement of pattern, of lead lines, common in the backgrounds of most windows. Another point, and I have done. Painters that do nothing but run after pretty faces to paint, are not artists. If there is a fault even in early Italian art, it is its slight hankering after the ideal. Now, early Flemish is far nobler. Matsys, Memling, Joseph of Ghent, &c., had no ideas of classical straight noses, or of freezing machines generally: they painted the people they saw: they painted the colours they saw. What noble, manly, characteristic work it is! and what a noble painter the same feeling and country have produced now,—Leys, one of the very few men who paint wholly right in this vulgar, pot-house age—age of iron railings; age that hates hedges; age that loves the cold formality of Greek form in preference to the honest, manly, rough old Flemish! A great test of the excellence of Flemish mind and painting is the fact that it withstood the influence of the *renaissance* of Classical art longer by two hundred years than Italy. About late Belgian work there is a quaintness of great manliness; and that quaintness of character in a great degree exists to this day: it has produced Leys; just as, in England, Queen Anne's time saw some excellent quaint architecture, pottery, and furniture; particularly in country towns beyond the reach of the civilizing element.

There is a beauty in Flemish art which is not noticed by our "classics;" and it is a beauty which gives intense natural life to work; I mean the crowds of figures: how they are all huddled together, the numbers coming up from the back to the front: this foreshortening has a wonderful natural effect. I do not think too many figures can be crowded into a painting: the more the merrier, is thoroughly true when said of Flemish art. In Limoges work it is to be found too; it is so jolly and unacademic. Again I ask for crowds of figures huddled together, and plenty of them coming up from the back to the front. There is a glass window in the Exhibition full of this.

A. W.

COMBUSTIBLE HOUSES.

WHEN the public mind is alarmed at the melancholy loss of life occasioned by an accidental fire in one of the mansions of the wealthy, it cannot be amiss to inquire why our houses are constructed of combustible materials, and built after designs pre-eminently calculated to facilitate their destruction by fire? The vulgar answer would be, that fires make good for building trades. But the folly and malice that could dictate such a reply are too patent to render a serious refutation necessary, for the persons who are presumed to benefit by such disasters are among those who reside in fire-feeding structures, and, consequently, run the same risk as others. Still there are somewhere culpable negligence and indifference, for there are more fires and greater loss of life from them in London than in any other city in Europe, although we possess, on a more extensive scale, and in a higher degree of efficiency, the means for prevention and suppression in a watchful police,

an abundant supply of water, and an admirably organized body of fearless firemen.

If there be a proverb more generally accepted than another, it is that "prevention is better than cure." But until the Building Acts of 1840 and 1845, in our imperial and local legislation with respect to fire in dwelling-houses, prevention had no place, except the regulation of the thickness of party walls enacted to cut off fire from neighbours' houses; and the requirements that chimneys and chimney-shafts should be of brick or stone, or both combined, and of certain specified thicknesses. All our energies had been directed to provide means for extinguishing fires, and not their prevention. The Acts passed during the present reign go as far, perhaps, as is practicable, considering our national dislike to government control and interference, and our respect for individual freedom; for they limit the tenuity of chimney-walls, fix the distance of beams from wall surfaces, prohibit the use of timber in chimneys, and require that every first-class dwelling-house containing upwards of 125,000 cubic feet shall have fire-proof stairs, and landings carried on fire-proof supports. Sufficient time has not elapsed since the passing of these two Acts for us to speak positively as to the influence of their provisions in the prevention of fires: but we may draw conclusions by comparing the number of houses built anterior to the Act that have been burnt down, with the number of houses built subsequently that have been similarly destroyed, having due regard to the additions made to the number of houses during the last eighteen years. To enable an accurate judgment being come to, it will be necessary for Captain Shaw, in his next annual report on London fires, to state the dates of building of the structures whose destruction he certified. They could be obtained without great difficulty, and the expense attendant on their publication would be trifling. Were this done we should, perhaps, discover good grounds for satisfaction at the results of recent legislation. If we now suffer from the improvidence of the last generation of builders, our successors will benefit by our prudence, although not to the extent that is desirable; for, despite Acts of Parliament, and interference of district surveyors, there is scarcely one house in a thousand that is really fire-proof.

A perusal of the Metropolitan Buildings Acts will satisfy the reader that legislation has gone as far as it can, and that it is not by its means we must seek for immunity from fire, but rather in the change of certain building materials, and in a more substantial system of construction. There can be no necessity to describe how and of what materials an ordinary London house is built—the walls not a line thicker than the parliamentary minimum; rafters, landings, passages, floors, stairs and their supports of the most inflammable turpentine-charged timber; partitions of laths, veneered with plaster and papered; skirting-boards arranged to conduct currents of air to feed the flames, and to communicate the latter from floor to walls; doors, window-frames, shutters, and architectural decorations also of easily combustible wood, and the rooms of the vulgar rich filled with furniture like a broker's shop—all fuel to feed the fire. Then, as if these arrangements were not sufficient to create risk, gas is generally introduced to dry every particle of timber in the house to the condition of touchwood, so that a spark will suffice to set the whole in a blaze. The late Mr. Braidwood stated, in a paper read before the Society of Arts, that the effect of gas lighting in private houses was to bring the woodwork into a state resembling that of a body liable to spontaneous combustion. No better proof of the tinder-like condition of our homes can be required than is furnished by Capt. Shaw's report for last year. Out of 659 fires, of which the causes were ascertained, 86, thirteen per cent., were due to sparks, which a man may receive on his hands without feeling alarm. Twenty-two per cent. were due to candles. Lucifers, fuses, meat falling in the fire, lighted paper, ashes on the hearth, and airing linen are among frequent causes of fires; and yet in a properly-constructed house, with the timber in what may be termed a natural state, scarcely any of these things would generate a fire that would burn so rapidly as to consume the inmates before they could escape, and so fiercely as to gut the whole structure in a couple of hours.

There are two main elements in promoting fires. The first is the use of very inflammable timber for joists, beams, and bearings; the second is the peculiar system of constructing ceilings, and the hollow internal divisional walls or partitions—all of which have been long since abandoned by our neighbours across the Channel. Here, the partition is ordinarily composed of a hollow framework of timber-quarters carrying slender laths, on which two thin coats of mortar are laid. The thinner the coats, the greater economy of room area, and the less cost for material and labour. The mortar being wet, partially protrudes between the laths, and thus forms a hold, but the partition

remains hollow, and furnishes a very convenient channel for the flames to travel from one floor to another. Nor is this ready and facile means of communication the only evil of the system. A plastered ceiling, if the flames act on the face of the plaster alone, will resist a long time, but the hollow combustible partition admits the fire to act on the ends of the joists as well as between the flooring boards and laths, and behind the plaster of the ceiling. In Paris the partitions, when formed with timber framework, have the spaces between the two surfaces of laths and the quarterings filled up solid. Rough stone rubble, chips, odds-and-ends, are loosely filled in. Then mortar is plastered on and forced between the laths, so as to fill the interstices formed by the irregularities of the rubble, and thus incorporate the whole, laths, quarterings, and filling-up, into a solid wall. Where timber is not used, the partitions are formed of hollow bricks made excessively thin, and some of no greater thickness than an inch and a half. They are regularly built up on the side, and well bedded in plaster of Paris, so that the cost of material and labour is not much, if any, more than that of timber and rubble partitions. The surfaces being tolerably level, require but a thin coat of plaster to carry the paper or paint. The hollows in the bricks interfere with the transmission of sound, the weight is less than that of the old-fashioned partitions, while the absence of quarterings and laths makes the structure fire-proof, and affords no harbour for vermin.

The advantage which the Paris system has over the London one in cleanliness, comfort, promotion of health, and security to life are incontestable, and must be evident to all who will condescend to give the subject a moment's reflection. Although unable to speak positively, we believe it has an advantage in cost; at all events, when we remember that bricks in Paris are double the price they are in London, that the cost of mortar and labour is about the same in both capitals, it may be assumed that, if it be advantageous to employ hollow brick partitions there, a greater saving must ensue from using them here. The chief impediment to the adoption of this improvement appears, so far as can be learned, to proceed from the fact, that the manufacture of hollow bricks has remained in an imperfect state, although invented here. Those that are procurable are made dense and compact, so that they weigh nearly as much as, and in some cases more than, solid bricks, from having been subjected to great compression when nearly dry. Beart's multitubular bricks, and Bale's glazed bricks with two perforations, leave nothing to be desired for walls that have to carry weight, but they are altogether useless for partitions. For the interior divisions of a house that have no weight to carry, the bricks should be of the loosest texture, and as light as possible; the more porous the better, and they need require no more care in their manufacture than common drain tiles. While our architects are quarrelling about styles, and speculative builders determine how nearly our lives and property may be endangered, it is too much to expect, perhaps, that they will follow the practice of their continental brethren. But if one of the most eminent members of the profession should be burnt to death in his own house, or a batch of Fellows of the Institute consumed in their place of meeting, the profession might condescend to recognise the fact that brickwork is safer than lath-and-plaster.

The most efficient obstacle to the spread of fire from one story to another, is a fire-proof floor. In some London houses, Fox and Barrett's system has been introduced; but as it consists in the employment of cast-iron girders and concrete, the weight and cost are serious objections to its general use. Years ago, before iron girders were adopted, Paris floors were made so as to resist the action of fire for a long time, and, in fact, to be, for all practical purposes, fire-proof, even though the beams were of wood. When the joists had been laid and framed together, stout battens, instead of laths, were nailed, wide apart, to the under side. A platform of rough boards was formed parallel to the surface of the battens, about an inch below. The coarse gypsum used as mortar was laid on the upper surface of the battens, and forced between them, under the joists, and into the inch space between the underside of the battens and the platform. On the mortar setting, the platform was removed, and the battens were found incorporated, and the joists embedded. When the reconstruction of Paris began, the rise in the price of timber, and ingenuity of French architects, led to the introduction of rolled iron girders in the place of timber joists. The spaces between the girders were filled in with earthenware cylinders, set endwise in plaster, which, swelling when dry, gripped the girders tightly. The cylinders were about the size of the body of a ginger-beer bottle. Subsequently, M. Collas, inventor of the reducing machine, by which MM. Barbedienne produce their charming copies of sculpture, suggested the employment of hollow parallelograms of

plaster, or burnt clay, to fill up the spaces between girders. This system is now almost universal. The floor is not only fire-proof, but is durable, remarkably light, healthy, free from vermin, and an obstacle to the transmission of sound, while there is no reason to suppose its cost is much more than that of a wooden one. If French builders and architects find an advantage in the substitution of incombustible for combustible floors, how is it that English builders and architects remain wedded to the old and dangerous method? Bricks and iron are fully one-third cheaper here than in Paris, and Englishmen are no more inclined to risk their lives and property by fire than Frenchmen. The explanation will not be creditable to our enterprise and intelligence. It was stated the other day, in the *Times*' review of metallurgy in the Exhibition, that English iron-masters will not, or cannot, produce light rolled iron girders. The plea of inability is all nonsense; though its maintenance compels builders to employ cast-iron girders when they depart from wood. Now cast-iron is the very worst of all materials to employ for construction. It is treacherous; in case of fire, it shivers like glass when played on with water, and tumbles the edifice to the ground. Its weight is so great, that it necessitates extra thickness in the walls, and its bulk detracts from economy of space. Then, again, architects are too apt to regard the employment of iron for structural purposes as coming within the province of civil engineering, and somewhat *infra dignitate*; so that, what with the standstill routine of iron-masters, the lack of enterprise of builders, and the prejudices of architects, we are compelled to remain in jeopardy, while our neighbours enjoy great security to life and property from fire.—*Building News*.

THE ECCLESIASTICAL ARCHITECTURE OF GEORGIA AND ARMENIA.

BY THE REV. GEORGE WILLIAMS, B.D.

THE CONVENT AND CHURCHES OF SAFFARA.

I MUST beg you to accompany me up the lovely valley of Borjom, into the wild volcanic district of Abhaltzie, where in a narrow gorge which opens on the left bank of the river Ourawelha, an affluent of the Kuv, are found the extensive and picturesque ruins of the Convent of Saffara, built on an artificial platform, partly levelled in the rocky hollow of the valley, partly formed of solid masonry. Its eastern and western boundary walls are drawn right across the rugged valley; the northern and southern walls run along its steep sides, following the irregularities of the ground, having a circumference of more than half a mile. At the north-west angle of the enclosure is a castle, situated on the wall itself at its highest part, and commanding the whole position.

The monastery was dedicated to the Blessed Virgin; but its principal church, with which I shall commence my description, as I did my survey, is named after St. Saba, a saint of Palestine of the fifth century, whose celebrated monastery in the wildest part of the wilderness of Judæa is known to all who have travelled in that country; and this dedication of a Georgian church to a comparatively obscure local saint of Syria, is an interesting national memorial of a well-attested historical fact, that the Georgian Christians of the Middle Ages were among the most numerous and devout pilgrims to the Holy Land, where they were treated with greater consideration by the Moslems than any other pilgrims.

The exterior plan of St. Saba's Church is a parallelogram. Its interior cruciform, similar in this as in other respects to the church of Timotheosméné, which I have before described as a type of the larger churches of Georgia. The nave of a single bay; the peculiar aisles; the transepts extending the whole width of the building; the deep apsidal sanctuary (semicircular within, flat square without), flanked by chapels, so to speak, with similar terminations; and the polygonal lantern at the intersection of the roofs, are features common to the two buildings, as is also the massive stone roofs with the bold overhanging coping. The general dimensions are nearly the same, the Church of St. Saba having slightly the advantage in size.

The construction of the arches is of the rudest type of Romanesque, utterly devoid of mouldings or ornaments of any kind. A short shaft resting on the crown of the principal arch supports two smaller arches, lighting a triforium gallery over the diminutive aisles, which open also by narrow round-headed arches into the transepts.

The church, sufficiently lighted by the elegant lantern (circular within, but polygonal without), has windows only in the centre of the

apse, and the extremities of the transepts, small single lights of Romanesque, very much splayed.

Of the side chapels of the sanctuary, that on the north communicates with the sanctuary as well as with the transept; the south with the transept only, as at Timotheisméné. The apses of both are pierced with narrow round-headed lights much splayed. In the apse of the north chapel still stands a very remarkable altar, consisting of a round shaft with a cushion capital, the abacus of which serves as the holy table, being not much more than a foot square. In front of this is another modern altar, which is still occasionally used.

Immediately within the entrance of the south chapel, on the right, a hole in the floor suggested the idea of crypts, which the situation of the church seemed fully to warrant, and the native's account of large vaults extending under the whole church—filled with human bones—to which this was the entrance, excited my curiosity, which was far from satisfied, when having, after infinite trouble, effected an entrance by means of a rickety ladder, without rounds, I found that the crypt extended only under this small chapel. However, I had done my duty as an ecclesiologist, and risked my neck into the bargain.

I shall have done with the interior of the church when I have further mentioned that the walls appear to have been covered with frescoes. The most intelligible of what remains is also probably the most interesting. It is on the wall of the south transept. The picture represents two Georgian princes—atabeles—in rich national costume, still in use, presenting a model of the church to our Saviour through the intercession of the saint to whom it is dedicated. The figures are larger than life, the treatment no doubt conventional, but very effective. As to the identity of the saint there is no question, since his name is written in the character called "khoutzouri," near his head; and the name and title of one of the chiefs has been deciphered: "Beka, spasalar, generalissimo of Samtzhké." The fragments of a longer inscription were read, and are translated in M. Brosset's 2nd Report to Prince Verontzoff.

The inscription obviously amounted to an invocation of blessings temporal and spiritual on the restorer of the church, in consideration of his services to the house of the Lord: and this benefactor was Sargis, commander-in-chief of the Samtzhké, son of Beka, chief of the mandators—whatever that may mean. These notices will be of service when we come to the history of the church, which we must now leave by the west door, in order to examine the porch, when we have just noticed, by the way, that there is also a north door giving entrance into the north aisle, richly ornamented without, and having in the tympanum a foliated Greek cross, with the brief inscription, "Christ, the Word of Life."

The porch is 26 ft. long by 9 ft. 6½ deep, with north and south doors, supported by three round arches, resting on round shafts. The beauty and finish of its exquisite arabesque chiselling form a remarkable contrast to the rudeness of the interior work, to which I have already adverted, and would seem to indicate a later period, and a further advanced stage of architectural science. And yet, on the other hand, the exterior ornamentation of the doors and windows of the church, which is almost equally rich—specimens of which I am able to exhibit to you—and which seem to be coeval with the building, prevent me from positively adopting this hypothesis, especially as the inscriptions on the porch itself apparently belong to the same period as the princes whose names are recorded in the interior. One of these inscriptions runs partly round the window of the porch, and is as follows: "This temple was finished, after the foundation . . . by the hand of Pharelas-Dzé (or the son of Pharéla), God assoile him." Without the circle, in characters not carved, but only painted, is apparently the date; but impressed in a manner utterly unusual in Georgia. The numerical value of the characters is 500 + 100 + 9 + 1 = 610; but as the era is left absolutely undetermined, the date must be purely conjectural. M. Brosset suggests that the copyist—the universal scapegoat in all such cases—has inserted the 100 by mistake, and that the date should be 509 [510] (of the Pascal cycle to wit), which would correspond with 1289 A.D. [the cycle only numbers as far as 532]; from which he concludes that the date ought to be read 629, = 1309 A.D. Such a deduction from a baseless hypothesis does not satisfy us; but I have nothing more plausible to suggest, unless we are at liberty to suppose that the Mohammedan era was in use in Georgia—as in other parts of the Christian east—which would give us a date corresponding with A.D. 1213.

On the curved stone which forms the lintel—or rather the tympanum—of the west door of the church, are two very remarkable inscriptions. I translate them as curious memorials of the Georgian

Christianity of the Middle Ages:—"In the name of God, I Okra, son of Gabatza, have offered 100 botinats . . . to establish for ever an agape for the first Lord's Day of the Pascal full moon. Whosoever shall alter this institution is anathematized by the mouth of God."

The botinat was a coin of the Eastern Empire, which derived its name from the Emperor Nicephoras Botoniatas, who reigned from A.D. 1078—1081. The other, beneath the preceding, is still more curious:—

"In the name of God, with the assistance of the most holy mother of God, and S. Saba, I, John, spiritually blessed, the son of Ghaw, of my own free will, being in full possession of my faculties, have offered to S. Saba my estate of Tzikhis-Djouan, without reserve, with the fortress, the church, the waters, the woods, the forests, the royal demesnes, the corn-lands, the vineyards, in one word, all. No one has any claim on them, my father himself had offered them . . . except my portion. The principal of the monastery, who partakes in this benefaction, will not refuse me religious priests (to celebrate). Whoever shall take away from S. Saba my estate, he shall make satisfaction for my sins. May his soul . . . in his unfaithfulness to S. Saba. All this that is written is enough, and more than enough. The *lata* shall celebrate for ever the agape written on the door. Whosoever shall alter this is anathematized by the mouth of God."

Beneath this, again, in large, deep cut characters, is the dedication of the door itself: "Lord God, receive this door as Thou didst receive the obol of the widow. God have mercy on the pilgrim, George Malé. Amen."

At the side of the great charter is this: "Lord, have mercy on Tarkha Tbéli. I have offered to S. Saba of Tzikhis-Djouan my estate . . ." Unfortunately none of these names are known to history, so that they determine nothing as to the date of the church.

I proceed now to the other buildings. Adjoining the porch on the south side, and so covering the west front of the south aisle, is a small Lady-chapel (of our Lady), said to have been built before any of the others. It has no exterior inscription, but within, in fresco, are the portraits of Sargis and his two sons Beha and Chalwa. This is important, as fixing approximately the date of the building: for Sargis of Djag is the prince who first established the independence of the atabeles, under King David V. He died in A.D. 1285, and was succeeded by his son Beha I., whose son, Sargis II., we have already seen depicted on the wall of the south transept.

Attached to St. Mary's, and abutting on the south wall of the great church, extending as far as the transept, is the chapel of S. Marina, not more recent than the others. It is distinguished by a narthex, which covers its west front, and has a separate lean-to roof. The arabesques at the east end of this chapel are remarkably rich, and many loose stones lying on the ground are exquisitely chiselled. On the north wall is the following inscription: "Lord supreme, Divine Christ, who exalteth those who glorify Thee, exalt in both worlds our Lord Beka, chief of the mandators, and his sons: who has deigned to grant a place of sepulture to us, unworthy to be his dust; to Laswir, son of Laswir, and his brothers." Under this inscription are full-length portraits of the three brothers, Swibat on the left, Laswir on the right, entitled, chief of the *makhours*; between the two Nicolas in a monastic habit; to whom, probably on this account, the place of honour is assigned. Opposite to these under a window are the figures of S. George, S. Demetrius, and S. Theodore.

This, then, was a mortuary chapel of these three brothers: and the state of the ground in the middle of the building seems to indicate that there was formerly a sepulchral vault beneath the pavement. Beyond, i.e., south of this church of S. Marina, is the small chapel of S. George, on the front of which M. Brosset saw a rude carving of S. George and the Dragon, which is now lying among the rubbish of S. Marina's Church.

This chapel is very diminutive, being only 13 ft. 4 in. long, by 8 ft. 2 in. wide. But it has a north side-chapel, 10 ft. 6 in., by 5 ft. wide. This tiny chapel has an altar *in situ*, similar to that in the north chapel of the cathedral, i.e., a square abacus, resting on a cushion capital, supported on a round shaft, entirely of a Norman type. The dimensions of this altar are 3 ft. 2½ in. high, the table being 1 ft. 9¾ in. long, 1 ft. 3¾ in. wide. I thought it was a curiosity of diminutiveness, which led me to take the measures. In the east apsidal window of this chapel was a small stone model of the Church of the Resurrection at Jerusalem, another record of the spirit of pilgrimage. This stone bore an invocation of spiritual blessings on the deacon Gabriel-Bagrat.

This Church of S. George was erected by one of the superiors of the monastery, as an inscription on its west front attests. "In the

name of God, I, Grigol Naphchounis-Dzé, superior of the holy brothers who dwell here at Saphara, have built this small chapel in memory of my sinful soul, to the end that the Lord may, through the intercession of S. Saba, the illuminator of monasteries, draw me from the midst of those on His left hand, and count me among those on His right hand. The Lord have mercy on Grigol, the builder of this."

I have further to notice a very small mortuary chapel, at the north-east of the church of S. Saba, said to have been the depository of the abbots. It has three rows of vaults, now exposed, and filled with skulls and human bones.

To the west of the large church is the belfry, consisting of a polygonal lantern, to which there is an ascent from the exterior, while the ground floor is occupied by a small chapel, dedicated to S. John Baptist, over the door of which, on either side of a Greek cross, is this brief inscription. "S. John Baptist, have mercy on Joseph of Djag and his sons. Amen." The tomb in the chapel is doubtless, that of Joseph, otherwise unknown to fame; but the fortress of Djag is known as the cradle and nursery of the race of the Georgian atabegs, on the right bank of the Troblanha (or Djagis-Tsqual) to the north-west of Akhaltsich.

The last chapel I have to name, is that of S. Simon (Peter), close to the northern entrance; very small, and remarkable for nothing but the exquisite beauty and solidity of the masonry, which, indeed, it shares with all the other sacred edifices. The Prince Toumanoff informed me that this stone must have been quarried very many miles—I think he said as much as sixty miles—from this spot, as there is none to be found nearer. It is a fine, compact limestone, with a rich pink or rosy hue, which imparts a glow of warmth to the whole of the buildings.

The castle, which crowns the steep at the north-west of the church, and forms an imposing object, presents nothing worthy of special remark; and I believe I may bring my over-long description to a close, when I have mentioned that absolutely nothing remains of the domestic buildings of the monks, except fragments of walls and foundations, among which I liked to fancy I could identify the refectory not far from the small chapel of S. Peter.

TSOUNDA.—We must now ascend the River Kur some twenty miles, passing the romantic village of Khertwis, with the fine ruins of its once magnificent castle, situated on a bold, rocky promontory, formed by the confluence of the Tapravanié and the Kur, until we arrive at the extensive ruins of Tsounda in the midst of a district full of interest for a geologist. The village is situated on the right bank of the Kur, which here makes a considerable bend to the south. But we are, at present, only concerned with the church, which stands at the outskirts of the modern village, entirely abandoned to decay, though still capable of complete restoration at a moderate outlay. It is of the same type as that of Daba, already described as the model of village churches; but it has some features peculiar to itself, which I proceed to describe. It is based on an artificial foundation formed of three or four courses of very large stones, rising to a height of ten or twelve feet, and is thus completely isolated, nor are there any indications of the steps by which the ascent must formerly have been effected. The Romanesque doorway in the west front is stopped with solid masonry, laid in regular courses, and in the centre is a cross richly carved, with bunches of grapes suspended from the arms. Over the door is a single window, and one on each side, similar to those of Daba, with arabesque bands equally rich. This door is in the wall immediately overhanging the precipice. On the south side the church appears to have been based on the natural rock, which rises abruptly from a small plain. Here, in later times, a porch has been constructed, of irregular form, giving entrance into the church under a flat dome, very richly carved, but now much decayed. The door is flanked with shafts of very peculiar character, baluster shafts they may be called, but they more resemble the bed-posts of the Jacobean period, than any known order of classical or Gothic art. The church is about 30 ft. long by 20 ft. wide, divided into two bays by flat pilasters, with an apsidal termination; the outer wall being, as usual, rectangular. But the most notable feature of this church is a small court on its south side, surrounded with a wall some eight feet high, which is pierced with loopholes, and was evidently not only intended but actually used for a bastion, as the marks of balls and bullets are still to be seen on the outer face of the masonry: another of the numerous tokens that exist throughout this country of the hard, and sometimes desperate struggles, by which these chivalrous Christians maintained their faith for many centuries against the vastly superior forces of their Mohammedan invaders from the south. The church, unfortunately, is not dated; but from its masonry and ornamentation, I

should be disposed to assign it about the same date as the church of Daba, i.e., the first half of the fourteenth century. It is now called S. George's Church, but an inscription on the tympanum of the western doorway, informs us that it was dedicated to S. John Baptist, by Itch-kith son of Gourgen, a name unhappily not known to history.

WARDSIA.—Still ascending the Kur, which here runs through a rocky gorge, dominated by the picturesque castle of Tioumoule or Imogvi, situated on an almost inaccessible hill on the left bank of the river, we reach the rock-hewn convent of Wardsia by a road scarcely practicable. This convent is entirely excavated in a precipitous rock, which rises from a narrow plain on the left bank of the Kur, and consists of nearly 400 chambers of various dimensions, among which are found one large cathedral church and six or seven small chapels. The whole place has been given over to centuries of desolation or desecration, during the occupation of this part of the country by the Turks; but quite recently, a vigorous lay-brother, a Greek from Trebizond, has been earnestly employed in clearing it of its pollutions. The cathedral has been restored, so to speak, and furnished with a new iconostasis; and the divine offices, with the Liturgy of S. Chrysostom, are again celebrated there by a Greek priest, also from Trebizond, in the presence of a few of the orthodox villagers from the neighbouring village of Tsounda. I can only briefly notice the cathedral, which is situated about the middle of the convent. It has a kind of porch, opening into it from the south, supported by two pillars left in the live rock, and is lighted by apertures pierced in the same. It measures about 45 feet by 25 feet, and is about 40 feet high; the rock at the east end is formed into an apse. On the north is a kind of aisle of irregular shape, in which is the mausoleum of the renowned Queen Tamar, who passed much of her time at this place, and whose spacious apartments, with their wide divans, all excavated in the natural rock, once communicated with the church by a passage and stairs, still to be traced. This queen, who died in A.D. 1212, was daughter of George, who reigned from 1156 to 1184, and is said to have commenced this monastery, which was finished by his more renowned daughter. Of the chapels I can only mention one, which is entirely covered with frescoes, evidently executed by a Greek artist, probably a monk of Mount Athos, for not only are all the subjects treated, and all the figures represented in the conventional style of the Greeks, but the names and legends attached to each are certainly in the ancient Greek characters, though Brosset has pronounced them to be Georgian. The only piece of masonry in this extensive convent is found in the entrance gateway, which may also have served for a belfry; but the upper story is now destroyed. This building, which is comparatively modern, may date from the restoration of the monastery, after its violation by (Tamerlane) Thab-Thamaz, about the middle of the eighteenth century.

MTZHHETHA.—I have yet to describe the most venerable, and to me the most interesting of all the ecclesiastical monuments of Georgia, situated also on the Kur, but at a distance of little less than two hundred miles from the convent last described. Only one post short of Tiflis, at the confluence of the River Aragva with the Kur, is found the site of Mtzhetha, once the civil and religious capital of the Georgian kingdom, the venerable cradle of the national church, and the seat of its Catholicus, until, within the last few years, the Russian bureaucratic rage for centralisation, most unhappily, as I think, transferred the metropolitan see to Tiflis, and merged this ancient independent branch of the orthodox Church in the holy governing Synod of St. Petersburg.

Meanwhile, the material land-marks of this much-enduring church still remain, mutilated and debased no doubt, and grievously shorn of their ancient dignity, but only the more dear on that very account to those who cherish a feeling of veneration and love for what presents the noblest example which ecclesiastical history has preserved of allegiance to the faith of Christ, under hardships and privations and persecutions which have no parallel in any other church in Christendom.

I have two churches to describe, the "Ouspenshi Sabor," or church of the Assumption, and the Cathedral of the Twelve Apostles. The Ouspenshi Sabor is the conventual chapel of a small nunnery, which doubtless occupies the site of a more numerous and influential religious house attached to this abbey church, in the palmy days of Georgian Christianity. It stands in a court of some considerable size, surrounded by a high wall, within which, on the south and south-west of the enclosure, stand the houses of the nuns and the hospitiary and guests' house, which are modern constructions and demand no notice.

The north-east angle of the close is occupied by a very small chapel dedicated to the memory of S. Ninia, the apostle of the Georgian

nation, who, a humble slave girl herself, emancipated the king and people of the land of her captivity with "the glorious liberty of the children of God." At the north-west angle is a square tower, with a polygonal lantern, with a conical roof, which may formerly have served for a bell-tower, similar to that over the chapel of S. John Baptist at Saffara.

But I must proceed now to notice the church itself, which is of the same type precisely as that of Timotheasméné, and as the principal church of the Convent of Saffara. I shall therefore notice only those features which are peculiar to this church. Externally I have to notice a double base-table, the lower $4\frac{1}{2}$, the upper 9 inches deep; each 9 inches wide, serving as a continuous pedestal for the pilasters, which support an arcading that runs round all that part of the original wall of the church which is still exposed to view; for additions, of which I have to speak presently, have been made to the church, both on the north and south sides. This arcading is common to this church and the cathedral, and I see, from drawings, that it was applied also to other churches in Georgia. It is admirably executed, and indeed the whole construction of these walls is a masterpiece of masonic art. The east wall is arcaded in five, giving one arch to each aisle, and three to the chancel, which rise much higher than the side arches. There is a curious angular recess between the two shafts that support the side arches of the chancel, the only exterior indication of the apsidal termination within, for these recesses are formed in the thickness of the wall formed by the apse. But the most remarkable feature in this church is the chapel abutting upon its south wall, and forming, in one of its bays, the porch of access to the church itself. This chapel is covered with a gabled roof at right angles to the roof of the church, and tiled, while all the other roofs are of the same solid ribbed stone as we have noticed elsewhere. There were formerly a brick porch at the west end, which is now in ruins, and a lean-to cellar-like building covers the northern wall for a length of $65\frac{1}{2}$ feet from the west end, being only 14 feet wide. The church measures externally 90 feet by 56 feet, not including the chapels. I must not quit the exterior without mentioning the very rich arabesque ornaments which cover the gables of the transepts, which are arcaded in three; the wall border, the middle arch being pierced with two lights, while the side arches, which are much narrower and lower than the centre, serve as frames for double blind lights, which seem never to have been pierced.

Entering into the interior through the second bay (from the west) of the south chapel, the arch of which is nearly double the width of the others for the purpose of forming a porch, we find this chapel highly ornamented with good stone carving of the Byzantine character. It is divided internally into four bays; whereof the easternmost has an apsidal termination, the next bay to this has a flat dome vault resting on pendentives, exquisitely sculptured, and its walls are richly arcaded and recessed. The interior of the church itself corresponds in all its main features with Timotheasméné and S. Saba, already described, but a low stone screen of Byzantine character, with the arches entirely open, in place of the usual iconostasis of closed panels, is a peculiar feature of this church. The synthronus here is more developed than in the church of S. Saba. There is in the centre of the apse a large throne, to which is an ascent by four wide steps, which run entirely round the apse, and seem to have formed a double row of benches for the chapter of the convent. Besides the episcopal throne in the apse, there is an ancient canopied throne, richly carved in stone, raised two or three steps, attached to the eastern face of the pier which supports the lantern on the south side of the nave; and in the corresponding position on the north side is a very massive chair in black marble, without any carving. The former of these was said to be the throne of the Metropolitan, the latter of the heguman.

This church was undergoing very extensive repairs when I was there, and was entirely denuded of furniture, which considerably facilitated my survey. The nuns were meanwhile assisting in the offices at the cathedral, which I have next to describe. I shall be as brief as possible.

The Cathedral of the Twelve Apostles is a building of the greatest interest to the sacred archaeologist and ecclesiologist, as being that which undoubtedly occupies the site of the first church of Georgia, erected during the reign of Constantine the Great; while the existing building, though often ruined by accident or violence, and as often restored, yet unquestionably exhibits in its main features the identical church in which many generations of the orthodox kings of Iberia received their coronation unction, and in which the mortal remains of the royal family have been interred for centuries. But we are at pre-

sent engaged with the *architecture*, not with the history and antiquities, of Georgia.

The church is situated within a kremlin—a name common in Russia to any fortified enclosure surrounding a church, such as that most celebrated one at Moscow: the Acropolis at Athens, or the Capitol of Rome, would have been kremlins to the Russians. The high wall of this enclosure is flanked with square and circular towers, which give it quite the character of a fortress; and the buildings occupied by the priests and servants of the church are situated on the west and south sides of the close: the palace of the Metropolitan I did not distinguish amid these half-ruined habitations.

The church itself has the same double base-table, and an arcade running round the walls, with niches in the east end, similar to the Church of the Assumption; but it has also some curious sculptured stones placed in the wall at random, as it would appear, by way of ornament—some carved in arabesque patterns, others rude representations of animals unknown to zoology—possibly recognised in Georgian heraldry. I found the church to be 160 ft. by $66\frac{1}{2}$, interior measure. The height of the lantern, I read, is 112 ft.

It has these peculiarities. A narthex, covering the whole of its west front, besides the square porch which we have found in the other churches. This narthex has a roof of its own, lower than that of the church, so that the aisles of the nave have windows in their west walls, above the roof of the narthex. The church has also double transept aisles, which within appear like an extension of the nave eastward, and of the sacrum westward, one bay each; it is only the roofing that indicates that they really are what I have stated them to be. The iconostasis is advanced westward of the eastern aisle of the transept, and stands between the two eastern piers of the lantern. A modern and tawdry iconostasis has lately been substituted for the old one, the fragments of which were resting against the south wall of the transept, and the grim-visaged figures of the old national saints in their picturesque costumes appeared to me much better to harmonize with the genius loci than these miserable specimens of modern art and debased taste. The lantern is a polygon of sixteen sides, and springs immediately from the pendentives, without the intervention of the circular drum which is found in the Church of the Assumption. Between the piers of the nave on the south side is a low square column, surrounded by a wood frame, canopied and covered with ancient paintings—an object of special veneration to the Georgian Christians, as being the place where a miraculous flow of ointment indicated the presence of the seamless coat of our Lord, the most precious relic of the Church and nation. Close by this, on the east, is the throne where the Georgian kings were crowned by many successions of Catholicos, from the days of Miriam, their first Christian king, until the last of the royal line, George XIII., at the close of the last century. There is an ascent of two steps to the synthronus, which is divided into stalls, five on each side of the throne in the apse, with an extension eastward along the flat wall of the sacrum. Immediately behind the altar is a large and massive silver cross, used in processions, covered with Byzantine chasing, very rich and of great antiquity. The church also possesses a reliquary of ancient date, which the Catholicos was wont to wear as a breastplate on great occasions, in imitation, it may be presumed, of the Urim and Thummim of the Jewish high-priest.

This allusion has carried me again to Jerusalem, and I must not leave this interesting church without directing your attention to a stone model of the Holy Sepulchre, which is erected against the south wall of the narthex—another memorial of the old communion between the Georgian Church and the Holy Land, to which I have already more than once referred, and to which I must further allude, in conclusion, in order to call to your notice the remarkable resemblance that is still found to exist between those churches which I have described, and two of the eleven churches which still exist at Jerusalem, which are historically known to have belonged originally to the Georgians. I allude to the Church of S. James, now held by the Clementians, on Mount Sion, and the Convent Chapel of S. Salvador, occupied by the Franciscans since the sixteenth century. I am enabled, through the kindness of Signor Pierotti, to exhibit ground-plans of both these churches, and a section of one, a glance at which will at once show you how remarkably, in this instance also, architectural science confirms historical testimony.

I was to have said something on Armenian as well as on Georgian Ecclesiology, but have left myself less than no time to do so, having already exceeded the limits assigned me. I regret this the less, because, having been prevented by illness from exploring the Armenian

churches of Tiflis, and from prosecuting my contemplated journey into Armenia Proper, I could only have reported upon them at second hand, from books, which probably are accessible to all, in the reading-room of the British Museum. I thought I should be doing better service if I confined myself to the results of my own actual surveys of buildings which have either never been described and illustrated at all before, or in so very slovenly and careless a manner as to mislead rather than to guide the student who would investigate this almost untrodden, but most interesting and instructive field of eclesiological research. I feel that I have done but scanty justice to my subject, but I trust I have furnished you with elements for the investigation of the curious question of the place which Georgia occupies in the development of religious architecture—a question which appears to me to offer some problems not very easy of solution, and which I gladly leave in abler hands.

PROJECT FOR THE NEW PATENT OFFICE, LIBRARY, AND MUSEUM.

It has been said that no evil comes alone; the aphorism might be as easily and as truthfully changed to "No good comes alone." Those who may have watched for the last few years the history of public improvements, will readily recal to mind instances in which one improvement has been the harbinger of another. A national or local disgrace has often been changed to a national or local honour. But lately, a number of buildings, dilapidated and useless, were pulled down in triumph in one of our manufacturing towns, and when the work of demolition was completed, handsome architectural structures were ordered to take their place. We believe that the great improvement of London by the adoption of the Thames Embankment Act, will only be the forerunner of many other great improvements now required.

A project has lately been made which will serve to illustrate our remarks. The Commissioners of Patents have, it is well known, for some years been desirous to obtain an eligible site for building a new Patent Office, a Library, and a Museum. In the month of April, 1855, four of the Commissioners reported to the Lords Commissioners of Her Majesty's Treasury upon the subject, requesting the sanction of the latter to the expenditure of a sum of 30,000*l.* for the building of new offices, sufficient ground being taken for the extension of the building from time to time, as may be required. This report was transmitted to the Board of Works, with instructions that a convenient site should be provided for the proposed new Offices, Public Library, and Museum, and also that plans and estimates should be prepared for Parliament. In 1859, a site was approved of, lying at the northern extremity of the gardens of Burlington House; and consequently plans and estimates were prepared by Messrs. Banks and Barry, who were appointed by the Board of Works; but this plan was in the same year abandoned, owing to a change of Government. Since then, no other site has been provided or suggested, until within the last few months, when it appears, from a report issued by the Patent Office, that another effort has been made. The Commissioners had proposed the erection of the new buildings on Fife House and Gardens, in Whitehall. This proposal was, however, delayed for a time, in consequence of the question relating to the great scheme of embanking the Thames being still undecided. Now that this difficulty is removed, and the several roads have been set out and definitively fixed by the Thames Embankment Act of the present session, the Commissioners of Patents have rightly put forward their claims to consideration.

The rooms now used and rented, in Southampton Buildings, have been for years insufficient for the purposes to which they are used. These buildings are hired at an annual rent of, we believe, 490*l.* In the year 1855, the Commissioners of Patents established a free public library within their offices, containing works of science in all languages, the publications made by the Commissioners, and the works upon patented and other inventions. This library has since then been considerably increased, a great number of the works being gifts. As this is the only library within the United Kingdom in which the public have access to this class of useful works, it has been resorted to by a great number of inventors, engineers, and mechanics, and other gentlemen connected with the patent business. The library is now so overcrowded, that many of the books remain in cases, and lie piled on the floor, because accommodation cannot possibly be found in the building for them. Standing room is also a great defect, and was the cause of a memorial, requesting immediate attention to the subject, being presented by Robert W. Kennard, Esq., M.P., and forty-five other gentle-

men, to the Commissioners for Patents. This memorial was sent on the 22nd of July of the present year.

But another and a more cogent reason for additional accommodation, perhaps, may be found in the existing state of the Patent Museum. Every one knows that the Commissioners are in possession of a collection of very valuable and interesting models of patented machines and implements, with the portraits of inventors, equally valuable, the majority of which are gifts, and others have been sent on loan; and that these models, &c., are exhibited in a small portion—doubtless as large as the Committee of the Privy Council for Trade can assign—of the South Kensington Museum. It has been considered by the Commissioners to be highly desirable, and indeed necessary, to make the Patent Office Museum a historical and educational institution for the benefit of the workmen of England. One of the most important steps which they desire to take is, so to arrange the models in their museum as to show the progression which every branch of manufacture has made. "For example," says the Report, "taking the case of steam-boats; in order to show the rise and progress of this invention, it is necessary to exhibit in a series of exact models of machines, or by the machines themselves, each successive invention and improvement in steam propellers, from the first engine on the paddle system, that drove a boat of two tons burthen, to the powerful machinery of the present day on the screw system, in first-rate ships of war." This the Commissioners can do, as they have the models, and several other interesting original machines have recently been added to their museum. This scheme requires no special pleading at our hands; it is so palpably plain, and commends itself to the serious consideration of all who are interested therein. The worth of such an arrangement would be invaluable. Our workmen at the factory and at the shop can, with the assistance of such a museum, devote an evening to an attentive consideration of the wonderful strides that have been made in the different branches of machinery, and that without difficulty or inconvenience, as far as the museum is concerned. The Commissioners have done wisely in recommending that it should be contiguous to the library, in order that readers may be enabled to read the books and inspect the models at the same time and place. This plan would be much more comfortable to the readers than having them in the same room.

As far as the proposed site is concerned, there is very little doubt but that it will meet the necessities of the Commissioners. The offices will, if the Report be carried, be situated in the middle of a new street running from the new roadway of the embankment to Whitehall. The Commissioners also propose to reserve a piece of land from the museum to the new roadway, which is to be appropriated for the extension of the museum in future years. The Crown leases of Fife House and the several buildings which adjoin are at the disposal of Her Majesty's Commissioners of Woods and Forests, the leases having lately expired.

Any one who has visited the Patent Offices and Library in Southampton Buildings must see that it is next to impossible to go on much longer in their present condition. Something *must* be done. Much more room *must* be obtained; and we consider the best way out of the difficulty is to immediately follow the recommendations of the Commissioners, and erect suitable buildings in Whitehall.—*Building News.*

PATENTS CONNECTED WITH BUILDING.

IMPROVEMENTS IN THE MANUFACTURE OF NIGHT-LIGHTS.—A. I. Austen. Dated Dec. 30, 1861.—This invention consists in producing transparency in the case, and a polish on the outside of the ordinary thick box or "round" used in the manufacture of night-lights, by saturating the box with a candle or night-light material of a higher melting point than the fatty material which the box surrounds. The method most suitable in producing this transparency and polish is to steep the box in a preparation of stearine and wax, which, when withdrawn, is allowed to drain in a hot closet; the boxes are then placed on a mandril, and while revolving in a lathe or otherwise a polish is produced by the friction of a flannel or other suitable pad.—*Patent abandoned.*

IMPROVEMENTS IN VENTILATORS OR VALVES FOR REGULATING THE PASSAGE OF AIR OR OTHER FLUIDS, WHETHER OF A GASEOUS OR LIQUID FORM.—N. McHaffie. Dated Dec. 31, 1861.—Here, when applying a ventilator or valve for admission of external air, the patentee causes the current of air to impinge on a surface so arranged that, when the current of air exceeds the velocity considered desirable, the surface

may be able to yield to it, and on yielding may close or partially close the valve. When the force of the current diminishes, the valve again opens, it being so weighted as always to tend to do so. For the passage of liquids, this last-mentioned surface should be mounted on a horizontal axis, but instead of being at or near its lower extremity, it should be at or near its upper extremity, on account of the greater density of the fluid, the passage of which is sought to be regulated.—*Patent completed.*

IMPROVEMENTS IN DEFLECTORS FOR LAMPS. (A communication.)—W. Spence. Dated Dec. 31, 1861.—The object here is the prevention of the partial obscuration of light from the lamp, caused by surrounding the flame with a deflector composed of an opaque material, and consists in the substitution of a deflector composed of glass or other transparent material for that which is ordinarily composed of metal. The deflector is in form similar to those in ordinary use as applied to lamps in which kerosene and other heavy oils are burned, such form being that of a hollow cone, with a hole at the top of the form required to suit the form of the wick.—*Patent completed.*

IMPROVEMENTS IN THE CONSTRUCTION OF APPARATUS FOR HEATING AND CIRCULATING WATER AND OTHER LIQUIDS.—T. C. Clarke. Dated Jan. 1, 1862.—This relates to the construction of the bottom or the fore part of those apparatuses usually built in brickwork, and known as cast boilers, such boilers being mostly used for heating and circulating water or oil through pipes or tubes for warming green-houses and other buildings. To obtain a large heating surface and economy of fuel, the patentee casts the said apparatus of a cylindrical form, with a water-jacket round the same, and with hollow fire bars across the bottom, so that at the back of almost every part where the heat impinges there is a water space, and as all the water spaces communicate with each other, a circulation is maintained, as is well known. In the side of the cylindrical casing before named, there is an opening in the brickwork through which to supply fuel. Near the bottom there are water supply or return pipes, and near the top are the exit or hot water discharge pipes, which may be connected to another boiler placed above the one just described, so that the water may be further raised in temperature before discharged into the circulating pipes, and the waste heat economized. To prevent waste of fuel there is a cover or flue plate placed on the top of the boiler to prevent the heat escaping too rapidly, which may be regulated by the dampers.—*Patent completed.*

IMPROVEMENTS IN GAS BURNERS.—E. F. Davis. Dated Jan. 1, 1862.—The object here is to cause the gas, while passing into and through the burner, to become regulated and controlled with regard to its pressure, to be at the same time purified, its illuminating power increased, and its consumption economized. The lower part of the burner consists of a receptacle containing charcoal; above the charcoal a perforated cover or disc, having the edge furnished with a screw thread (immediately below which is a gauze wire to prevent the charcoal stopping up the perforator), is screwed down inside the receptacle, which has a corresponding thread cut therein, so as to form a cap, and force down the charcoal, as may be required according to the pressure of the gas. The upper part of the burner consists of a dome and a nipple screwed thereon, the interior and upper portion of the dome being furnished with a double layer of wire gauze, a similar duplicate layer being placed in the lower portion of the burner beneath the charcoal. The dome is to be screwed on the lower part of the burner, and the whole is then ready to be attached by a male or female screw at the bottom of the burner to the gas pipe. The gas will then pass through the layers of gauze, and through the charcoal and perforated disc into the dome, and through the upper layers of gauze into the nipple, becoming in its passage not only purified or rendered smokeless and increased in its illuminating properties, but regulated in its passage, and its consumption proportionally economized.—*Patent completed.*

IMPROVEMENTS IN METERS FOR MEASURING GAS, WATER, AND OTHER FLUIDS, UNDER ANY PRESSURE, EVEN THE SMALLEST, WITHOUT MAKING ANY CHANGE IN THE APPARATUS.—J. J. Gutknecht. Dated January 1, 1862.—The patentee claims, 1, the arrangement of fluid-measuring apparatus, in which the capacity of the measuring chamber is controlled by a piston and flexible diaphragm, by whose motion the quantity of fluid passing through the water is indicated and registered, all as described; 2, the arrangement of parts described as applied to a fluid meter, whereby the valve which regulates the admission and escape of the fluid to and from the measuring chamber is caused to change its position quickly at the completion of the stroke of the measuring piston or diaphragm by the action of springs placed in position for that purpose, as described.—*Patent completed.*

IMPROVEMENTS IN CONSTRUCTING WORKS BELOW WATER.—J. Wright. Dated January 25, 1862.—This consists in forming continuous foundations for sea and river walls, or like structures under water, by the use of cylinders or coffer, in the constructing of cofferdams.—*Patent completed.*

IMPROVEMENTS IN GLOBES AND GLASSES TO BE USED WITH HYDROCARBON LAMPS.—B. Martindale. Dated January 27, 1862.—By this invention the breakages arising from the chimney being fixed at the base so near to the flame will be avoided. The patentee takes a globe of the common moon shape, or other suitable shape, and suspends inside it from the top a glass peridifume, or bell-mouthed tube; or it may be formed in one piece with the globe. Another form of globe, which will answer well, is made by shaping the globe into a flattened spheroid, and forming a neck rising out of the top of the globe, so that the glass presents the appearance of a peculiarly shaped bottle. Several modifications are given.—*Patent completed.*

IMPROVEMENTS IN MACHINERY FOR MAKING NAILS AND SPIKES. (A communication.)—C. T. Bousfield. Dated January 21, 1862.—This relates to a novel arrangement of parts, constituting an improved nail-making machine, in which two pairs of compressing rollers are used for tapering the ends of the metal rods fed into the machine to a suitable shape for forming nails or spikes, in combination with a cutter for severing such tapered ends from the rods, and a heading die for striking up the heads of the nails or spikes while the same are held firmly between nipping dies, the object being to effect in a rapid and economical manner the conversion of rods or bars of iron or other suitable material into nails or spikes.—*Patent completed.*

IMPROVEMENTS IN STREET AND ROAD-SWEEPING MACHINES, PARTS OF WHICH ARE APPLICABLE TO THE SEPARATION OF LIQUID FROM SOLID SUBSTANCES. (A communication.)—E. A. Brooman. Dated January 21, 1862.—This invention consists:—1. In the employment in machines for sweeping streets and roads of two side brooms for drawing the mud and dirt into the path of the chain of brooms by which it is to be raised into a receiver. 2. In the particular construction and arrangement of the chain for carrying the brooms. 3. In the means afforded for raising the whole sweeping apparatus off the ground. 4. In the method of attaching the sweeping machine to the receiver for collecting the material swept up. 5. In the particular construction of the receiver to fit it for separating the heavy from the more liquid material swept up, so that the liquid may, in case of need, be used for watering the streets or roads. The details of the invention are voluminous.

IMPROVEMENTS IN LATHS FOR VENETIAN BLINDS, IN PAINTING SUCH LATHS, AND IN RAISING AND LOWERING VENETIAN BLINDS.—E. Pace. Dated January 22, 1862.—The patentee claims:—1. The manufacture of laths for Venetian blinds by a slicing knife as described. 2. The construction of laths for Venetian blinds by gluing or cementing together two or more leaves or thicknesses of wood sliced or cut out of the plank as described. 3. Painting the laths by a roller or rollers in manner described. 4. Raising and lowering blinds by a roller fitted with a ferrule, in which is inserted a divided spring plug, substantially as described.—*Patent completed.*

IMPROVEMENTS IN ENGINEERING AND ARCHITECTURAL STRUCTURE.—E. W. Hughes. Dated January 14, 1862.—This consists in constructing cylinders or tubes suitable for columns or supports used in engineering and architectural structures, by forming and combining plates of wrought or malleable iron, each of which is rolled with two other projecting flanges, which are produced at angles greater than a right angle to the plane or outer surface of the plate.—*Patent completed.*

IMPROVEMENTS IN PREPARING SHEET LEAD FOR COVERING FLOORS, STAIRS, AND OTHER LIKE PURPOSES.—J. Riddale. Dated January 15, 1862.—This consists in sinking by pressure from presses, rolls, or hand tools, designs or patterns on that surface of the sheet lead which, when laid, is to come uppermost, and in filling up such sunken designs or patterns with colour or not, according to requirement.—*Patent completed.*

IMPROVEMENTS IN THE CONSTRUCTION OF STOVES OR FIRE-PLACES.—J. Tow. Dated January 18, 1862.—The object here is the construction of stoves or fireplaces for heating apartments or buildings, whereby the draught can be easily regulated and the escape of smoke into the room or apartment prevented. There is also an arrangement by which hot air may be conducted from such stoves to any part of a building. Stoves or fireplaces constructed according to this invention are formed in several parts, so that they may be readily taken to pieces for examination or repair, and for facility in fixing.—*Patent completed.*

THOUGHTS, PRACTICAL AND PHILOSOPHIC.

AN EAGLE IN COPPER.—Contemporaries have already made known a very remarkable work executed in copper by Mr. Thos. Phillips, of Snow-hill, London; but we cannot allow it to pass by without a few words of description and praise. It represents a "golden eagle" in vigorous action,

Standing on the jag of a mountain crag:

its wings are extended (they measure from tip to tip 5 feet 2½ inches), and with open beak and flashing eye he screams defiance. Every portion is represented with scrupulous fidelity. The minute feathers which cluster round the neck, the fine hair-like down which runs from the beak to the eye, the cushion of plumage at the junction of the wings and body, are here separate, and can be each separately raised by the finger. The half-hairy, half-feathery legs of the bird are wonderful in the fineness of the down which overspreads them. The most extraordinary triumph of Mr. Phillips's skill, however, is shown in the extremely minute feathers which cover the frame of the pinions, and which conceal the fastenings of the large feathers forming the tips of the wings. The rock, a mass of tin and antimony in combination, is bold and effective. The metallic lustre of feathers, so difficult to imitate in painting, is rendered with great felicity. The maker says there are more than 10,000 feathers, formed from ordinary copper-plate, all made by hand, some of which had to pass twenty-six or twenty-seven times under the hammer and graver. For six or seven years this work has been in hand; and it is most satisfactory to us to find that to this patient labour has been added artistic skill. He has not merely imitated feathers, but conveyed expression.—*Builder*.

THE PICTURESQUE IN ARCHITECTURE.—A NEW CLOCK-TOWER IN PARIS.—It would appear, judging from the effect of a recent erection in Paris, that the very plainest modern style may, by judicious treatment, be made to develop such features as will necessarily render it "picturesque," in the ordinary acceptance of that term; that is to say, by causing it, in the first place, to present an unusual variety of outline, through the medium of projections and recessions, as will essentially vary the main form of the mass, and impart to it certain broad effects of light and shade. Secondly, to enrich it with appropriate details, which, while they pleasingly attract the eye, at the same time arouse curiosity, and cause the attention of the spectator to dwell with satisfaction on the effect of the general design, while it is induced to seek for other remote features; being tempted forward by those prominent ones which first caught the eye. The *muraille d'enceinte* with which Louis Philippe enclosed Paris, along with large tracts of suburban land as yet not built upon, and also several detached suburban villages, gave a great and sudden impulse to building beyond the old limits of Paris. The vacant spaces were rapidly filled up, detached villages grew rapidly forward in the direction of the solid masses of the city, and new districts were formed, each with its *mairie*, as in the *arrondissements* of the old city. Among these Le Petit Mont-Rouge became the fourteenth *arrondissement*; and on its *place*, bordered with a quadrangle of limes, a suitable site was found for the erection of a mayoral residence, suitable to the increased dignity and importance of the place. The building then erected was of sufficient size, and presented a certain originality of treatment, the more worthy of remark, as the originality was achieved by the simplest means, and without the aid of any so-called decorative features. It was severely simple, and yet it bore evidence, though as plain as an ordinary house, that it was the work of a thoughtful and tasteful architect. Le Petit Mont-Rouge again increased and prospered; and it was thought, the other day, that, as a public clock was required, it afforded the opportunity of adding a clock-tower to the pretty but simple mayoralty. A certain impress of taste in the building, plain as it was, appeared to lend itself to this decorative addition; and the result has shown that appearances were in that case not deceptive. From a raised perron, in the centre of the principal front, a pavilion of three arches now rises, forming an appropriate porch to the principal entrance. These arches are very sparingly enriched with appropriate and delicately designed ornament. From this arched pavilion rises a square tower, on the front side of which is the clock. This part of the tower is, with severe simplicity, enriched with four high and nearly detached reliefs, representing the four principal epochs of civic life, in a military country: infancy—the conscription—marriage—death. The first epoch is represented by a woman carrying an infant; the second by a youth, in a civic blouse, seizing the national standard; a veiled girl, wearing a bridal wreath, represents marriage; while the last is represented by a woman placing a wreath of *immortelles* upon a tomb; all these figures possess con-

siderable merit as works of sculpture. The square tower is surmounted, above the clock, by a circular turret crowned with a gallery of columns supporting a small dome; the effect of the whole composition being exceedingly pleasing. It must be added, too, that the new feature is made to accord so well with the main building in general simplicity of feeling, that it hardly seems an extraneous addition, not provided for, nor even contemplated, in the original design of the work to which it is attached. A time is coming when successful imitation of former styles—Mediæval or Classic—will not be sufficient to found the reputation of an architectural artist, or even to sustain a repute already established. We shall be glad to see an English clock-tower grow up somewhere, in which the same kind of illustrative decoration as that which we have mentioned may be carried out.

GENERAL INTELLIGENCE.

FROM a pamphlet giving an account of the colony of South Australia, prepared for distribution at the International Exhibition of 1862, we learn the following particulars respecting that interesting colony:—The city of Adelaide, its capital, contains not a few important buildings, and there many of the luxuries of life are obtainable in its numerous stores and shops. There are no less than thirty-three miles of made streets in Adelaide, provided with macadamized roadways, curbed foot-paths, water-tables, &c. Water is conducted in pipes along all its streets, and into most of its houses, and is supplied at high-pressure from waterworks, by means of which the river Torrens has been turned to domestic and other uses, at a cost of nearly 250,000*l*.! The reservoir at Thorndon Park holds 150,000,000 gallons, or a six months' supply, so as to render the city independent in summer of the drying-up of the Torrens. Against fire, nearly 1000 fire-plugs have been fixed. Public baths have been established; and the luxurious colonists contemplate the erection of Turkish baths. Among the principal public buildings are, the Government House, an Italian edifice, which has recently been enlarged at a cost of 10,000*l*.; the new Government Offices, also in the Italian style, from a design by Mr. E. A. Hamilton, colonial architect, in 1857, at a cost of 13,000*l*.; the Parliament Houses, erected from a design by Mr. Bennet Hays, in the style of James I.'s time, and at a cost of about 15,000*l*.; the Supreme Court, with Grecian Doric portico and Italian flanks, built in 1849, at a cost of 10,000*l*.; the Post-office, Local Court House, and Police Station, in the Grecian style, with Italian clock-tower, and completed in 1850, at a cost of about 7000*l*.; the Armoury, Police Barracks, &c., built from a design by Mr. Hays in the Tudor style, at a cost of 12,000*l*.; and the new Custom-house, Court-house, and Police Station, at Port Adelaide, designed by Mr. Hamilton in the Italian style, and built in 1861, at a cost of upwards of 7000*l*. The Railway Terminus at Adelaide is an Italian edifice, erected under Mr. B. H. Babbage, C.E., in 1854, at a cost of about 7000*l*. There are various public buildings of more or less importance, including court-houses and police-stations, dispersed over the colony. Copper is one of the chief products of South Australia, whose Burra-Burra mines have for some years been well known in this country for their rich produce. Wines are also produced, as well as wheat, wool, and other articles. Alpaca and Angora wool are among the South Australian products exhibited at the Palace of Art.

A MEDIÆVAL PARTHENON.—The Church of St. Mary at Bury, built in 1424, on the site of a former church of 1002, appears, from its chief dimensions, to have been intended as a copy of the Parthenon at Athens; taken, of course, from a written description, without the aid of drawings. The extreme length of the temple and the church is 214 feet. The extreme width of the temple coincides with the outer boundaries of the church, apparently reserved for chantries, measuring from the north side of the tower to the street fence. This tower belonged to the old church, and most likely formed the limit of the church westward. The length of the nave would then have corresponded with the east cell of the temple. The internal and external width of the church and Parthenon, exclusive of the peristyle, is identical, being respectively 62½ feet and 67½ feet. Measuring from the south face of the tower to a responding point on the other side of the church, we have a width of about 42 feet, equal to that between the columns of the Parthenon. With regard to heights, the rise of the roofs in each case is the same; and the clerestory of the church is equal in height to the entablature of the temple. The entire heights of the two buildings are also equal.—*W. Scargill*.

DISCOVERY OF A FOSSILIFEROUS CAVE AT MALTA.—The *Malta Times* says that another of those interesting relics of a pre-human epoch was brought to light last week through the researches of Captain Spratt, R.N., whose scientific labours in connexion with the geology of these islands are so well known and appreciated. Vague rumours prevailed some years ago of the existence of a cave of this kind at Meliha, which coming to the hearing of the late lamented Sir William Reid, he directed the attention of Lord Ducie and Captain Spratt to the spot, but nothing then could be found. A fossil hippopotamus tooth, in the possession of Signor Pace, an Italian gentleman residing here, said to have been obtained from Meliha, led Captain Spratt to institute closer and stricter inquiries; and while in the bay of Meliha with his ship, a few days ago, he succeeded in finding the remains of a fossiliferous cave at a short distance from the village church. It had been, unfortunately, almost destroyed to make way for a road, and the rubble used to fill up the interstices of a wall; but sufficient remains of hippopotamus bones and teeth were dug up to indicate its having been of a similar character to the Meilach cave near Crendi, regarding which we lately published some interesting particulars from the pen of Dr. Leith Adams, of the 22nd Regiment.

PIER AT HILTON HEAD, SOUTH CAROLINA.—The great pier at Hilton Head, South Carolina, now completed, is upwards of 1400 ft. in length, the width being 40 ft., and the head, sometimes called the T, being 140 ft. long. The workmanship throughout is of the most solid kind. To sustain it, more than 1000 pine trees have been cut down, their trunks drawn from three to four miles, and driven far down into the sand.

ROMAN REMAINS AT NORTON, YORKSHIRE.—An extensive place of ancient sculpture has been recently discovered at Norton. An excavation was being made for sand, but the section of the ground showed that the site was one of a large pit which had at some remote period been thrown out, and refilled with a different material, chiefly very black soil. At a depth of about six feet a large stone was met with. This stone was 4 ft. 6 in. long, and 2 ft. 2 in. wide, and has been hewn into a diamond shape. After much labour, this heavy stone was removed, and beneath it was found the remains of a cist, containing human bones, and much Roman pottery, in fragments, of which portions of a lacrimatory and some cinerary urns are recognisable. There were several deposits of human bones in the sand adjoining, buried without any apparent regard for order. A Roman road formerly passed near the place.

CONGREGATIONAL CHAPEL FOR PARIS.—One feature of the Bicentenary movement is the proposal to erect a Memorial Chapel by the Congregationalists in Paris. At present they have only a room capable of holding 100 people. The cost is to be 6000*l.*, of which one-half has been already promised.

PATENT "MARETZO."—Mr. E. J. Bridell has patented "Improvements in the manufacture of substances artificially coloured, veined, or mottled, like marbles or other substances." In carrying out this invention the patentee employs in the production of the artificial substances made according to this invention, and which he calls maretzo, cements and other similar materials: by preference a cement or material that will form a hard compact substance, and afford a smooth surface capable of receiving a polish, may be employed. According to the colours of the veins or figures required to be imparted to the artificial substance, corresponding colours are mixed with the requisite amount of liquid in flat trays made shallow, in which are spread fibres of floss silk or silk waste, or other fibrous materials which will readily absorb the colouring matters, and readily impart the same to the substances treated as hereinafter described. The silk or other suitable material is fixed in the form of the veining or figure required by means of light frames of various sizes made of wood or wire, or the material may be also used at times without such frames. The silk is well saturated in the before-named trays of colour, and is then spread open with suitable instruments; and it is afterwards carefully taken up and laid, with or without a frame, upon a piece of glass, either flat or curved, as may be required, or upon some other smooth or polished surface made of suitable form, such as metal or plaster. When it is required to give a varied appearance to the substance, patches of suitable coloured cement are laid upon the glass: a layer of suitable coloured or tinted cement is then superadded. The cement is carefully spread, so as to be about one-eighth of an inch thick; and, after being allowed to remain a sufficient time to allow the saturated silk to part with its colour or colours, the silk fibres are removed either by raising the frames, or by using suitable instruments. The glass or other smooth surface is then shaken or agitated, so as to blend or harmonize the

colours, and a light coat of dry cement is sifted on for the purpose of extracting the *superfluous* water; and is afterwards gently removed by a plasterer's trowel. The material so prepared is then smoothed or trowelled all over, so as to form a slab or other required form. To consolidate and strengthen the slab he employs a backing of canvas, or other suitable fabric, which he applies to the slab.

ARCHÆOLOGICAL DISCOVERY.—The Academy of Toulouse has received an interesting report on the excavations recently made by M. Frédéric Troyes, in the grotto called Du Portel, in the commune of Loubens (Arriège), at about eleven kilometres from Foix. This grotto is situated at an altitude of 400 metres above the level of the sea; it has at present but one entrance, at the extremity of the Bois de la Peyrade. The interior is rendered difficult of access at two points, where the passage suddenly contracts to such narrow dimensions that the only way to get through is to creep on hands and feet. The whole length of the passage is 240 metres; it ends in a kind of hall, whence two secondary galleries branch off in different directions. The walls and ceiling of the grotto are covered with stalactites, while a stalagmitic crust occasionally conceals the floor. M. Troyes began his excavation on the 11th of May last, bringing to light a few fragments of coarse pottery, both ancient and modern, and a few bones of sheep and dogs, all near the surface. At a further depth, the bones of bears were found of three distinct sizes, two of which were very large, and at least equal in stature to the horse; the third was much smaller, but still different from the bear of the present day. The other remains of animals comprised those of various kinds of dogs, wolves, hyænas, pigs, a large kind of ox, the reindeer, and another ruminant, probably belonging to the antelope genus. On the 23rd of June, three implements of human manufacture were found. One was a hatchet, roughly cut out of limestone, the others being serrated lance-heads of different sizes. No human remains have yet been found, but there is reason to believe that the cavern was frequented by man from the very earliest ages.—*Galignani*.

"STEAM-POWER SUPERSEDED" BY "A NEW PRINCIPLE IN NATURAL LAW."—Mr. George Rydell, of Castle-street, Holborn, has invented and patented "an apparatus," which he also calls "a wonderful mechanical appliance," and of which he speaks when he "declares to the world that he has found out a mode of raising water from an unlimited depth to an unlimited height, without being in the least dependent upon steam-power," and "no matter what the quantity might be." He asserts that, although the *Great Eastern* has a steam-power of 3000 horses, he can "not only propel this monster vessel over the Atlantic at the speed it now travels by steam agency; but from cisterns of cold water, he can obtain even a greater power than it now possesses, without using any coal for navigation purposes; thereby leaving the 12,000 tons space open for additional cargo." The use of this new (hydraulic?) agency, however, Mr. Rydell seems mainly to contemplate using for the raising of water from mines. Shakespeare has something about protesting "too much."

THE third volume of M. Förster's "Monuments of German Sculpture and Painting" has been published.

NOTICE TO CORRESPONDENTS.

IN the execution of the Plates which form our Illustrations, we hope always to have the advantage of the designs of the Architects whose buildings we represent. We also invite those gentlemen, in every instance, to communicate both with our artists and ourselves during the progress of our drawings, and we shall always be anxious to secure their approval for every illustration on its completion.

The lithographs contained in the present Part have all been executed from the architect's drawings. Their accuracy may be depended on, and they will doubtless be preserved and valued as faithful pictures of interesting and chaste examples of the street architecture of London in the Victorian age.

All communications for the Editor to be addressed to the care of DARTON AND HODGE, Publishers, Holborn-hill, E.C.

MICHAEL ANGELO.



It is not often that we associate the heroic with Art; but in Michael Angelo we have an illustrious example of the artist morally athletic. Michael Angelo was a hero no less than a creator. It was his energetic character which moulded his opulent genius, whereas, for the most part, if the genius is the noblest, the character is the feeblest. Hence, from the sublime elevation to which Michael Angelo raises us, we have to view his productions as in the truest sense valiant deeds. The times of Michael Angelo were for Italy filled with sorrow and with shame. Art flourished magnificently; virtue deplorably decayed; yet the robust, the colossal individuality of the incomparable Buonarroti was almost sufficient of itself to atone for the ignominy and the guilt of his beautiful but unfortunate country.

At the Chateau of Caprese, in Tuscany, on the 6th of March, 1475, Michael Angelo Buonarroti was born. He was the son of Lodovico Buonarroti Simoni and of Francesca del Sera. The family sprang from the Counts of Canossa, who, besides antiquity and famous exploits, could boast of an alliance with the Imperial blood. Lodovico Buonarroti, though the chief magistrate of Chiusi and Caprese, in the diocese of Arezzo, was far from wealthy. He had numerous children. Michael Angelo, the fifth son, was put out to nurse at the village of Settignano, where there were large quarries. Like nearly all the inhabitants of the village, the husband of the woman to whom he was entrusted was a stone-cutter; and Michael Angelo loved to recal the fact that his earliest playthings were the mallet and the chisel. When the future sculptor, painter, architect, poet, engineer was sent to school, it was with a view to commercial pursuits. But though he devoted himself to the routine duties of the various classes, and made rapid progress, he could not resist his artistic instincts. In secret he learned to draw. The country-house of Michael Angelo's father is still in the possession of the Buonarroti family. What with rude materials, and in a rude manner, the boy artist traced on the walls of the rooms, no profane hand has been allowed to efface.

Where a vocation was so clearly expressed as in the case of Michael Angelo, it was vain to resist it. Lodovico Buonarroti at last, therefore, consented that his son should devote his time and talents wholly to art. Michael Angelo was placed, at the age of fourteen, with Domenico Ghirlandajo, one of the most distinguished painters of the fifteenth century. It was at Florence, his native city, that Ghirlandajo gathered his pupils around him; among these, Michael Angelo was not long in distancing all rivalry. On one occasion Michael Angelo received as an exercise a picture by Ghirlandajo to copy. By way of jest, he gave his own performance to the master instead of the original. Ghirlandajo would not have detected the harmless trick unless the other pupils had smiled.

There was in Michael Angelo, besides an extraordinary vigour, a no less marvellous precocity. Lorenzo de Medici, called the Magnificent, had collected in his gardens of St. Mark statues, busts, bas-reliefs, antique fragments. In doing so he had more in view than his pleasure: he wished to help in making Italian sculpture as fruitful and triumphant as Italian painting. To Ghirlandajo he spoke of his desires and designs in this respect. A few of Ghirlandajo's pupils were chosen to study in the gardens of St. Mark: two of them were Michael Angelo and his friend Granacci. Michael Angelo's earliest work as a sculptor—the restoration of an ancient faun—can still be seen in the Public Gallery of Florence. Lorenzo de Medici admired it so warmly that he at once took the liveliest interest in the artist, who was not much more than fifteen, gave him apartments in his palace, a salary of five ducats a month, and made him the companion of his three sons—Peter, John, and Julian. John, born in the same year as Michael Angelo, was afterwards Pope under the title of Leo X. Lorenzo, besides, often invited Michael Angelo to his table, where the chief personages of the Republic assembled. The favour extended from the son to the father: a more lucrative post was provided for Lodovico Buonarroti than that which he occupied.

A deplorable misfortune befel Michael Angelo during the course of his studies in the gardens of St. Mark, and in the Chapel of Mount Carmel, to which the frescoes of Masaccio attracted him. A fellow-student, Torrigiani, felt toward him the most deadly hatred. This has been ascribed to jealousy; but Torrigiani's own statement to Benvenuto Cellini was, that Michael Angelo was in the habit of turning his fellow-students into ridicule. In one of their frequent quarrels, Torrigiani struck Michael Angelo such a violent blow on the nose as to break the bridge. Thus was the great artist disfigured for life. Torrigiani fled from Florence to escape the punishment due to his brutality.

Lorenzo de Medici died in the spring of 1492. Overwhelmed by grief for the death of his protector, Michael Angelo went to reside for a brief season at his father's house. In Peter de Medici, Lorenzo had an unworthy successor. Peter, however, pretended to be, like his ancestors, the patron of art. Michael Angelo's place and privileges in the palace of the Medici were restored to him; but the vain, capricious, and frivolous Peter often condemned the artist to degrading offices. He caused him to erect a colossus of snow in the court of the palace, and he boasted that he had at his command two most wonderful men—Michael Angelo and a Spanish valet, who to extreme beauty joined such rare agility that a horse at full gallop was scarcely a match for him.

A short time before the expulsion of the Medici from Florence, in 1494, Michael Angelo went to Bologna, then to Venice. His money failing, he returned to Bologna. There existed at Bologna an absurd regulation, that every stranger was to carry on the thumb-nail a stamp of red wax, placed there by the police; for contravention of this order Michael Angelo was condemned to pay a fine. Not having the requisite sum, he was about to be thrown into

prison. A magistrate, Aldovrandi, came to his assistance, offering him alike protection and hospitality. In the house of Aldovrandi, Michael Angelo remained a year. No heavier duty was imposed on him than reading every day to his host, in the purest Tuscan accent, the writings of Dante, of Petrarch, and of Boccaccio. During this exile he is supposed to have tried for the first time his own powers as a poet.

Saint Dominic, the founder of the Dominican Order, died and was buried at Bologna. His tomb is an artistic miracle, which men travel far to see; but it was Michael Angelo who completed it, and gave it its most memorable ornament. He received, through the influence of Aldovrandi, the commission to prepare two statues for the tomb. These are the statue of a female saint, and that of a kneeling angel holding a torch.

Availing himself of a pause in the troubles at Florence, Michael Angelo hastened back to a city dear to him from so many associations. His indefatigable chisel speedily signalized his arrival. A little St. John was followed by a Sleeping Cupid. This Sleeping Cupid was destined to have a singular history. Michael Angelo appointed Baldassare of Milan to sell it at Rome. Baldassare buried it in his garden; then, pretending that he had discovered it by accident, he sold it as an antique to a cardinal at Rome for two hundred ducats; but he wrote to Michael Angelo that he had not obtained more than a hundred crowns. The Cardinal was extremely indignant at having been so impudently deceived. He knew who was the author of the fraud; he wanted to know likewise who was the author of the statue, and for this purpose sent a gentleman to Florence, whose suspicions fell on Michael Angelo. On entering the house of the artist, the gentleman asked him for a sight of some of his works. Michael Angelo had nothing ready at the moment. He took a pen, however, and drew a hand as astonishing for the anatomical knowledge as for the artistic perfection which it displayed. The drawing is now in the Louvre collection, and it has been frequently engraved. The gentleman's report to the Cardinal was enthusiastic, but did not much soften the latter's wrath, who caused Baldassare to be arrested and the money to be returned. To Michael Angelo the statue was restored, which subsequently underwent a variety of fortunes worthy of its first adventures. Relenting after a while, the Cardinal summoned him to Rome. It was for a Roman gentleman, Jacopo Galli, that Michael Angelo produced his Bacchus holding a cup, and accompanied by a little Satyr eating grapes. While on the one hand critics have praised this work for approaching nearer the Greek ideal than any other of the artist's sculptures, it has on the other hand been condemned for an offence against taste. The Bacchus is exhibiting symptoms of intoxication not in concord with his exalted nature as a divinity. Michael Angelo had here made the marble eloquent with abounding joy; he made it next speak the poetry of profoundest grief in the group of the Virgin holding on her knees her dead son. This group, so notable for the pathetic treatment of a pathetic subject, has been often reproduced in bronze and otherwise. But, moreover,

the spectacle, the saddest which Christianity can imagine or record, occupied his genius and his hand in a thousand ways. In numerous drawings, in pictures, in bas-reliefs, he poured forth his homage, his sympathy, the whole wealth of his passionate phantasy, to the mourning mother: and in the last work which, as a sculptor, he attempted, the mourning mother holding her dead son appeared.

The immense fame which Michael Angelo had been gaining, Florence yearned both to share and to increase; and to Florence not unwillingly he again turned his steps. At Florence he threw his whole energy for eighteen months into a colossal statue known as the Young David. In September, 1504, the statue was thrown open to public view on the spot near the old palace which it still adorns. Besides lavish applause, he received four hundred ducats. During a riot in 1527, the left arm of the Young David was broken, but immediately restored. In 1843 the work was subjected to a cleaning and repairing process, Lorenzo Bartolini being employed.

Many other sculptures of Michael Angelo at this period it is not easy to chronicle or characterize, for much which amazed and enchanted contemporaries has perished, and of much it is impossible to establish the authenticity.

Michael Angelo was one of those who, when wearied with toil, seek relief, not in absolute rest, but in variety of occupation. Throwing down the chisel, he took up the brush and painted a Holy Family. This picture is of a circular form, and represents the kneeling Virgin giving to St. Joseph, over her shoulder, the infant Jesus. In the background are naked figures meant for angels, but more resembling athletes, and with muscles exaggerated almost to deformity. Never had Michael Angelo so victoriously manifested the force and the boldness of his genius. Grace, beauty, and softness, however, flowing and natural lines, simple composition, fresh and magic colouring, were all absent.

A learned man, by his thorough and persistent study of anatomy, Michael Angelo was likewise a learned man in a more exclusively literary sense; and he seems, from time to time, to have felt the same need of literature as a predominant pursuit as of the plastic or the pictorial art. Renouncing alike the chisel and the brush as if for ever, he abandoned himself to loving commune with the most renowned Italian authors, and poured forth the tenderness of his strong soul in sonnets.

The Florentine Government wished the walls of the principal hall of the old palace at Florence to be covered with frescoes. Leonardo da Vinci and Michael Angelo were to be the artists. The subjects were to be from Florentine history. Both artists furnished cartoons, but the frescoes were not executed. The "Combat of Cavalry," by Leonardi da Vinci, was surpassed by Michael Angelo's "Episode from the War of Pisa;" the Pisans, when bathing, surprised by the Florentines, and hastening to seize their garments and their arms. The very excellence of this cartoon by Michael Angelo led to its destruction. In 1512 the envious Bandinelli cut it to pieces.

Engravings, however, have preserved for posterity a faint outline of the mighty idea which the great artist strove to incorporate.

To Alexander VI. succeeded on the Papal throne the warlike and impetuous Julius II., for Pius III.'s brief reign of twenty-six days is scarcely more than a chronological fact. Julius had grand conceptions and aspirations. He saw in Michael Angelo a nature kindred to his own, and he urged him to come to Rome. The artist obeyed. A favourite plan of the Pope was the erection for himself during his lifetime of an immense mausoleum. With the execution of the mausoleum Michael Angelo was charged. He began with his accustomed zeal, force, and inventiveness; but he was continually thwarted by the caprices of Julius and the calumnies and machinations of rivals. After spending a considerable time at Carrara in getting ready the materials necessary for the tomb; after finishing a few statues, some of which are now in the Louvre; after dreaming for a moment of cutting a mountain of marble into a colossus, Michael Angelo saw, on his return to Rome, that the Pope had been lending an ear too credulous to the voice of detraction. He was refused admittance once when he sought the Pope's presence to obtain money which he had advanced to the workmen at Carrara. "When the Pope has need of me," he said, indignantly, to the valet, "you can tell him that I have gone away." He forthwith departed, nor stopped till he had reached the Tuscan territory. Many couriers were sent after him, but he was deaf to their supplications and their menaces, travelling without delay to Florence. Through the Florentine Government the Pope assailed with fierce threats and incessant commands the fugitive, to which the latter was in no mood to give heed. It is even said that Michael Angelo was on the point of leaving Italy, and of accepting an invitation to Constantinople to build a bridge over the Golden Horn. But the Florentine Government lent its kind offices to reconcile the imperious Pope and the haughty and resentful artist. It was armed with the sacred and inviolable title of Florentine ambassador that Michael Angelo ventured again to meet the Pope. The moment the Pope, then at Bologna, saw the artist who had been transformed into an ambassador, he said to him, angrily, "It was for you to come to me; yet you have compelled me to come to you." Some days after, the Pope, being in a milder and more forgiving mood, ordered Michael Angelo to execute a colossal statue in bronze of him, the tough and turbulent Julius. The Pope remained at Bologna till the model was finished. With the right hand raised, the attitude of the figure was in the highest degree menacing. The Pope asked whether the figure was represented blessing or cursing. "Holy Father," said Michael Angelo, "it is warning the people of Bologna to be prudent." In the left hand the artist had placed a book. "Put a sword instead; I do not pretend to be a learned man," cried the fiery pontiff. Sixteen long and earnest months were bestowed on the statue. It was erected with becoming pomp in front of one of the Bolognese churches; but in 1511, during an insurrection, it was dashed to pieces by the people. Out of a portion

of the fragments Alphonso, Duke of Ferrara, made a canon, to which he gave the name of *Giulia*.

The work to which Michael Angelo owes the most brilliant and enduring part of his glory, he undertook with indescribable repugnance, and only at the stern and reiterated command of the Pope. Julius was desirous of enriching with frescoes the ceiling of the chapel in the Vatican which had been built by Sixtus IV. From ignoble motives—though the statement, like many similar statements, is questionable—Bramante and Raphael pressed the Pope to employ Michael Angelo. They hoped that, by venturing on a department of art with which he was unacquainted, Michael Angelo would forfeit the renown which he had acquired as a sculptor. But the heroic Michael Angelo made everything bend to his puissant and adamant will. He was merely stimulated and invigorated by what would have dismayed and paralysed others. The very scaffolding, simple and solid, was of his own invention. His cartoons being ready, he felt that, opulent and courageous as his genius was, he could not extemporize the knowledge and the practice of fresco-painting. Many second-rate artists were brought from Florence to instruct him. Scarcely had he seized the process, when he dismissed the poor drudges somewhat roughly. From an improper choice and imperfect preparation of materials, damp and other defects began to manifest themselves; but these, by the counsel of an experienced friend, were remedied. Pope Julius watched Michael Angelo with intense interest. With his habitual impatience, Julius threw the work open to the gaze of the Romans in November, 1509, though it was not quite half-finished. Three years after, the Romans were able to behold the work in its completeness and majesty. Both in the selection of subjects and in their handling it is notable for that singular blending of Paganism and Christianity which distinguishes Roman-catholic art. Before Michael Angelo, fresco-painting had often been little more than a tawdry and fantastical embellishment. His intrepid soul inspired it, clothed it with an epical character. Where there were difficulties, Michael Angelo seemed to delight in increasing them. All the materials he needed were mainly prepared by himself. Having to keep his eyes continually raised for four years and a half, he was a long time in getting his head and neck back to their natural position, and thus he had no small trouble when reading. Pope Julius complained that the sublime Scriptural figures on the ceiling of the Sistine Chapel had a look of poverty, and recommended gilding. But Michael Angelo emphatically protested, saying, "Holy Father, the men whom I have painted up there did not wear gold when living. They were not rich but saintly personages, who despised wealth." It was true of Michael Angelo himself, that he despised wealth when compared with the claims and dignity of art. For the poem which he had painted on the ceiling of the Sistine Chapel he received sixteen thousand ducats, rather more than six thousand pounds. To those who have not visited Rome, the wonders on the ceiling of the Sistine Chapel are known by engravings. But how many pilgrims have visited Rome,

perhaps attracted by those wonders alone! Sad that what is so divine should be so perishable, and that the wrath of nature or the barbarity of man may in a few instants hurl to ruin what so many generations have crowded to adore.

Early in 1513, Julius II. died. His successor, Leo X., loved art, but loved art graceful rather than art sublime; and the sweetness, the elegance, the exquisite finish of Raphael were more to his liking than the Titanic audacities of Michael Angelo. During the reign of Leo, therefore, which lasted till the end of 1521, and which is so memorable in connexion with the Reformation, Michael Angelo was torn away from congenial occupation and compelled to obey the Pope's despotic caprice. The aggrandizement of his family and the embellishment of his native city were objects more passionately and pertinaciously pursued by the Pope than the victories of consummate and diversified art at Rome. Precious years of the artist's life were wasted in obtaining enormous masses of marble from the quarries at Carrara and Seravezza for monuments at Florence. Some of the monuments proposed were never begun, some of them were never finished, and some of them slowly marched to completeness after Leo's death.

If, in reference to the arts, Michael Angelo and Leo X. were not in absolute harmony, between Michael Angelo and Adrian VI., who was pope from the beginning of 1522 till the autumn of 1523, there was flagrant disharmony. Adrian, an honest but heavy and pedantic Fleming, had a contempt so undisguised for art and culture, that he was called by the Italians the Barbarous Pontiff. To antagonize the Reformation, he strove to regenerate the Roman Catholic Church. The ancient preceptor of the Emperor Charles V., he followed a policy abjectly servile toward the schemes of his ambitious pupil. When Adrian died, the Romans expressed their joy by an almost tumultuous indecency. Beyond a few figures added to the Mausoleum of Julius, the indefatigable hands of Michael Angelo gave, while Adrian reigned, no sign of their ancient skill and pith.

Clement VII., the successor of Adrian VI., whose reign extended to September, 1534, was a Medici, and he had the marked Medicean genius. He had the sentiment for art of a Medici and of an Italian; but the progress of the Reformation, the restlessness of the Italian princes, the anarchy of the Italian cities, the fierce rivalry of Charles V. and of Francis I., offered him complicated and formidable problems to solve, which thwarted his systematic activity as a promoter of the arts. On the whole, his patronage and sympathy were of signal benefit to Michael Angelo, whom he encouraged as an architect, though instinctively Michael Angelo was more a sculptor than a painter, more a painter than an architect, more an architect than a poet, more a poet than a mechanician.

In February, 1525, the battle of Pavia was fought. Just a year after, we come upon a quaint but interesting letter of Francis I. to Michael Angelo, in reference to two sculptures of the artist, one of which, "The Christ Bearing the Cross," had been recently created. In the Church of

La Minerva at Rome this Christ continues to kindle the rapture of the spectator and to exalt the rapture into veneration.

The "Christ Bearing the Cross" might almost be regarded as the fittest symbol of Italy at the period. There was the burden of an unspeakable anguish as the prelude to an anguish still more cruel. The sympathies, the activities of Clement VII. sought to further the fortunes of the Medicean family more than to aggrandize the popedom, and to aggrandize the popedom more than to aid the emancipation of Italy. In May, 1527, occurred the sack of Rome by the thirty thousand furious troops of the Constable de Bourbon. Less than now had Rome suffered from the ferocities of the Goths and the Vandals. Everything became the prey of the brutal soldiers: the convents were forced, the tombs profaned, the altars robbed, the library of the Vatican torn into a hideous ruin, the godlike productions of Michael Angelo and Raphael destroyed or defiled. Wild bands of robbers completed the work of lust, of rapine, and of havoc. No solitary episode was the capture of Rome. Forty years of wars and of ravages had made Italy desolate. It is asserted that the major part of the Italian peasants had perished by the sword, by famine, or by pestilence. In such tragic circumstances it was perhaps a relief to Michael Angelo that his marvellous gifts as a mechanician were brought into play. Peace had been established between the Pope and the Emperor. The programme of their alliance included the restoration of the Medici at Florence. To this scheme the Florentine Government determined to offer the most strenuous resistance. Florence was put into a state of complete defence. The labours connected therewith were undertaken by various architects and engineers: to Michael Angelo the supreme direction was entrusted. Alphonso, Duke of Ferrara, had improved the art of fortification. Michael Angelo paid a visit to Ferrara to study the improvements. During this visit, the Duke said jestingly to Michael Angelo, that he considered the artist as his prisoner. He made Michael Angelo promise to give him, as the price of his liberty, a picture or a piece of sculpture. His own fertile and fervid brain, and the lessons learned at Ferrara, enabled Michael Angelo to fortify Florence in the mode the most organic and effectual. The siege having begun, the artist valiantly and continually placed himself at the most exposed points. Having, however, been insulted or wronged by the Government, he fled from Florence to Venice. At Venice he made certain ingenious but resultless proposals for the construction or reconstruction of Venetian bridges. The absence of Michael Angelo from Florence was severely felt by the besieged. A deputation was sent, humbly, earnestly imploring his return. His patriotism prevailed over his anger: behold him again at his post of peril. By his order the spires were covered with bales of wool, which shielded them in the main from injury. On one of the bastions Michael Angelo sculptured in demi-relief a figure representing military virtue. Spite, however, of all that Michael Angelo and others achieved, Florence, torn by intestine divisions, and betrayed by the mercenary troops

and their leaders, was forced, in August, 1530, to surrender. To avoid the horrors of pillage, the Florentines engaged to pay eight thousand crowns. The contemptible Alexander Medici was made Duke of Florence.

Proscribed, Michael Angelo sought shelter in the house of a friend from the vengeance of the triumphant Mediceans. Ere long, however, the Pope pardoned the artist, who, braced by patriotic sacrifices, recommenced, though in no joyous mood, his noble creations. Even while the siege lasted he had, as a sculptor, begun some groups or single figures. To fulfil likewise his promise to the Duke of Ferrara, he had, amid the roar of combat and the crash of artillery, painted a *Leda*, which was not more conspicuous for talent than for indecency. 'This picture having travelled into France, was burned by a zealot in the time of Louis XIII. Many of Michael Angelo's other productions had in France no better doom. While thus hosts of his more elaborate performances have perished, things which he intended not for the world, for posterity, have survived. Calling on a former pupil he found him absent. Michael Angelo drew a colossal head and left this as a visiting card. The drawing, which has come down to us, has sometimes been spoken of as a satire on Raphael's frescoes. There does not seem to be any ground for this malignant interpretation.

The favourite church of the Medici at Florence was that of San Lorenzo. An enlargement and immense transformations and enrichments of it had been resolved on by Leo X. Some part of the design, but not the principal part of it, was realized. His most diversified attributes as an artist, Michael Angelo manifested in the plan and the construction of the Laurentian Library, appertaining to the Church of San Lorenzo, though the entire decoration of the building was not terminated when Michael Angelo died. A new sacristy for the Church of San Lorenzo had been projected, but left unfinished, by Brunelleschi. With essential, and perhaps not always happy, modifications of his predecessor's idea, Michael Angelo completed the sacristy, which is also called The Chapel of the Tombs. The sacristy—a regular square, crowned by a circular cupola—is not deemed one of Michael Angelo's most fortunate architectural feats; but its two mausoleums are among the choicest treasures of which art can boast. Julian de Medici, Duke of Nemours, the son, and Lorenzo de Medici, Duke of Urbino, the grandson, of Lorenzo the Magnificent, were far from deserving such splendid monuments; the first was infinitely contemptible, the second infinitely odious. A statue of Julian himself, and symbolical statues of Day and Night, are the prominent features of Julian's tomb; besides a statue of Lorenzo himself, symbolical statues of Dawn and Twilight distinguish Lorenzo's tomb. The statue of Lorenzo, the infamous father of the infamous Catherine de Medici, so admirably expresses remorseful contemplation, that it has been named *Thought*, or *The Thoughtful*: it suggested Milton's well-known poem on Melancholy. Strozzi, a contemporary of Michael Angelo, celebrated the statue of Night in these words—"The Night which thou seest sleeping in an attitude so sweet, was sculptured

by an *Angel* (Angelo); forasmuch as she sleeps, she lives. If thou doubtest this, awake her, and she will speak to thee." But the artist, mindful that the Medici had ruined his country, and robbed it of its freedom, and that none had been more guilty than Julian and Lorenzo, replied in verses to this effect:—"It is happiness for me to be asleep, higher happiness still to be of marble in these days of misery and of shame. To see nothing, to feel nothing, is a blessing immense for me, therefore awake me not; and, for mercy's sake, speak low." In addition, there is in the sacristy of San Lorenzo a Madonna which the artist left imperfect. Critics miss in this Madonna the Greek simplicity; and though it is allowed that the movement of the infant Jesus, when turning towards his mother, is true and graceful; yet it is objected that there is a prodigality of muscle which would not be out of place in a young Hercules.

Alexander Farnese, who, as Paul III., succeeded Clement VII. in 1534, and who sat on the Papal throne till 1549, was an able man, an accomplished politician; and even Ranke has not been sparing in commendations of him. Paul III. was sincere in his desire for the reformation of the Church, which involved three hundred years ago the suppression of schism and the extirpation of heresy. From that desire sprang the Council of Trent. The alliance of Paul III. with the Emperor Charles V. threatened Protestantism with utter annihilation; well was it for Protestantism, therefore, and for the freedom of Europe, that the Pope and the Emperor quarrelled. Inclined to nepotism, Paul nevertheless had no prejudices or interests leading him, like the Medici, away from Rome; he was as willing as the greatest of the Popes to make Rome the centre of Christian art and of Christian civilization. The long reign of Paul III. was therefore decidedly favourable to Michael Angelo. Paul's munificence, however, often did not go farther than words. Overlooking the state of the exchequer, he made generous promises, which he was unable to keep. We may doubt, then, whether the salary of twelve hundred crowns, which he conferred on Michael Angelo in 1535, was regularly paid; but he encouraged the artist, and endeavoured to free him from the cares and the anxieties which hinder so seriously the calm development of genius. First had to be completed the monument to Julius II., which had lingered so long, and which had always been shrinking into smaller and smaller dimensions; it was placed in the church of San Pietro ad Vincula at Rome; its most characteristic and celebrated feature is the statue of Moses, unanimously pronounced the masterpiece alike of Michael Angelo and of modern sculpture. As Michael Angelo's taste was not equal to his genius, as he was the *Æschylus*—not the *Sophocles*—of sculpture, criticism has detected faults in the Moses, though applauding it with enthusiasm as sublime.

That the two extremities of the Sistine Chapel should be as gorgeously adorned as the ceiling by the hand of Michael Angelo, was equally the wish of Clement VII. and of Paul III. On the one wall, the "Fall of the Rebel Angels" was to be represented; on the other, the

"Last Judgment." The former of these intended pictures was not executed. For seven or eight years was Michael Angelo again busy in the Sistine Chapel. On Christmas-day, 1541; the "Last Judgment" was unveiled to the eager gaze of the crowd. But this huge fresco painting excites awe, almost horror, more than admiration; it contains three hundred figures, which critics commonly arrange into eleven groups; in the middle of the eleventh group, and above the centre of the picture, Christ is seen condemning myriads of the human race to eternal woe. Christ, here, is arrayed in no celestial beauty; there is no gleam of pity, there is not even the passionless serenity of the judge; but there is wrath inexorable, there is hatred inextinguishable. The other groups exhibit the dead starting from the grave at the sound of the trumpet, and the elect and the damned in the most contrasted positions. It is the province of art to idealize; but it was the tendency of Michael Angelo to be more realistic than nature—for even nature is herself an idealist. Painting may be allowed to approach the terrible, but never the hideous, the disgusting; it should never stir physical repulsion. Demons, inflicting on hosts of wretches the most frightful punishments, pure poetry would shrink from describing. And is it not a blunder that painting should attempt to make them vivid to the eye? Michael Angelo seems himself to have been conscious that he was carrying the tremendous to the verge of the revolting; for the Virgin Mother, placed at the right hand of Christ, is portrayed averting her shuddering glance. With the gloomy blends the burlesque. In this intensely Christian picture, Charon, after carrying over the souls of the damned, is furiously driving them into the cruel clutch of the demons. The "Inferno" of Dante does not shrink from the same absurdity. One of the groups is formed by purgatory; but a few demons—no souls in process of redemption—are here. What satire can be more bitter? The Master of Ceremonies to the Pope was Biagio. This Biagio hotly joined the unscrupulous gang of Michael Angelo's detractors. The artist took his revenge; he painted him in hell, making him ridiculous with the ears of an ass. Biagio complained to the Pope. "In what part of the 'Last Judgment' has he placed you?" was the Pope's question. "In hell," answered Biagio. "Thereat am I grieved," said the Pope; "if you had been in purgatory, the matter would not have been hopeless or irremediable, but from hell there can be no deliverance." Messer Biagio thus gained an immortality with which he would have been glad to dispense. In the "Last Judgment" the naked figures of saints and sinners alike were reckoned, even by those who were not fastidious, a flagrant outrage on propriety. To vanquish the scandal, Daniel de Volterra, a pupil of Michael Angelo, had to furnish clothing, however scanty. The same artist had also to disguise or efface what was too loathsome in the personifications of the seven capital sins. Some critics have only been willing to see in the "Last Judgment" a chaos of energetic expression, a riot of muscularity, a parade of anatomical science—anguish and despair exaggerated to monstrosity by a morbid and sombre imagination. Even the critics

who are more lenient urge the spectator to study the softer and more harmonious frescoes of Raphael and other foremost artists before drawing near to the "Last Judgment." From the simply natural we have to ascend to the graceful, from the graceful to the beautiful, from the beautiful to the sublime, and even they who have ascended to the sublime may shrink from the giddy heights and yawning abysses of the horrible.

In the School of the Fine Arts at Paris there is a copy in oil by Sigalon of the "Last Judgment;" it is the size of the original, and is praised for other merits besides that of exactness. Under the immediate inspection of Michael Angelo himself, a copy, exceedingly perfect, but on a very small scale, was executed by Marcello Venusti; the traveller will find it in the Museum at Naples. The engravings of the "Last Judgment," both as a whole and in groups, are numberless; indeed, it had already been engraved during the lifetime of the artist. Humidity, and the thousands of tapers which blaze every year in the Sistine Chapel at the ceremonies of the Holy Week, have impaired the lustre of this memorable picture.

There is a tradition that Michael Angelo, jealous of Raphael, favoured Sebastiano del Piombo as an instrument for counterbalancing Raphael's glory. From another tradition we learn that Michael Angelo, when about to paint the "Last Judgment," quarrelled with Sebastiano. The latter had persuaded the Pope that the painting should be in oil, and preparations had been made to that effect; but Michael Angelo stoutly refused to work otherwise than in fresco, saying that the art of painting in oil was an art fit only for women, or for lazy and cowardly fellows, like Sebastiano del Piombo. Every great man has his weaknesses and smallnesses; but on vague—it may be rancorous—tradition, should we condemn him?

For a chapel erected by Paul III., and to which he gave the name of the Pauline Chapel, Michael Angelo painted two frescoes—the Crucifixion of St. Peter, and the Conversion of St. Paul. Time has not dealt gently with these two compositions, which are, moreover, marked by comparative feebleness. They were executed when Michael Angelo was more than seventy, and he was in the habit of saying that painting, especially fresco painting, was not adapted to old age.

Of sculpture, however, he seems to have entertained a far different opinion. He consecrated his leisure moments to a group of four colossal figures, representing Christ taken down from the Cross, and in the arms of the Virgin; Nicodemus, and one of the Maries, beside the mother and the son. Though not finished, this work is yet venerated as a noble ornament of the Cathedral at Florence. Besides that sculpture was the art to which his soul spontaneously turned, Michael Angelo thought—and in this he was undoubtedly correct—that the use of the mallet was favourable to his health.

The increasing enslavement and degradation of Italy would have completely paralysed Michael Angelo if he had not been gifted with a will so indomitable. As it was, his discouragement was so overwhelming that he sometimes passed whole days without taking any food;

sometimes shut himself up for months, avoiding, as far as this was in his power, all human intercourse.

If aught could have roused him from his lethargy, it would have been the prodigious enterprise which absorbed the last eighteen years of his life—the building of St. Peter's Church at Rome. When, in 1546, after the death of San Gallo, this labour was forced on him, he could justly plead old age and insufficient architectural studies; but the pleas were rejected for two reasons. Michael Angelo stood unrivalled, alone, a true, puissant monarch in the domain of art; and he was so accustomed to conquer difficulties and work wonders, that men were unwilling to believe that fatigue or infirmity could ever break him down. And thus, when more than threescore years and ten, he had to gird himself for toil, for endurance, for persistent and creative endeavour, as if he were in the joyousness of youth, in the vigour of manhood. San Gallo had spent many years in preparing a model of St. Peter's Church. This model, which cost four thousand crowns, still existed. If it had been executed, a building of a most composite and fantastic character would have been the result—a building, besides, without originality, and a simple plagiarism from all the ancient monuments in the Eternal City. Michael Angelo undertook to furnish a model much more beautiful, and he maintained that if the building were erected in accordance with it, three hundred thousand crowns and the labour of fifty years would be saved. The model cost only twenty-five crowns, and was ready in fifteen days. The Pope accorded to Michael Angelo an absolute liberty to make, or unmake, as he might deem proper. Grateful for this confidence, Michael Angelo, with a magnanimous disinterestedness, refused to receive either salary or reward. He likewise rejected the most brilliant and generous offers of Cosmo I., who sent letter after letter, and messenger after messenger, urging him to come to Florence. Slowly, under his hands, the mighty pile arose which men have agreed to recognise as the consummate architectural marvel of the world. Though unremunerated, so far as silver and gold were concerned, Michael Angelo was not without the customary recompense of genius and heroism. The most venomous detraction, the most cruel persecution assailed him, but he had the unwavering and energetic support of the Popes, however different their characters might be. Julius III., who succeeded Paul III., and who died in March, 1555, neglected public affairs for pleasure, constructed magnificent gardens and villas, and was so frivolous and shameless as to confer the Cardinal's hat on a domestic for the care which he had bestowed on a favourite monkey. Paul IV., Pope from 1555 till August, 1559, was stern, strong, bold, turbulent, implacable. He sought with the same zeal the regeneration of the Church, and the emancipation of Italy from the Spanish yoke. Pius IV., the successor of Paul IV., and in whose reign Michael Angelo died, was weak and worldly, but with a tolerably keen and refined sense for the creations of art.

We have thought it needful to mention the various Popes who, from the beginning of the sixteenth century, were the contemporaries of Michael Angelo, because their

relations to him were of the most important kind, and profoundly moulded his career. Four years before his death he expressed an earnest wish to be freed from the responsibility of being architect to St. Peter's Church; but Pope Pius IV. would not consent. He was permitted, however, to have assistants, and it was commanded that, in case of his sudden decease, his plans were to be rigidly followed. Subsequently to Michael Angelo's death, one of the architects, Pyrrhus Legorio, having attempted a single innovation, was at once dismissed. The cupola which Michael Angelo had designed was not finished till 1598, and even some years after this, parts of Michael Angelo's lofty organic scheme still waited their accomplishment.

Though the erection of St. Peter's Church was the principal, it was not the exclusive occupation of Michael Angelo during his latter years. He created, or renewed, or finished numerous edifices. The Farnese Palace was completed by him. When the French besieged Rome, in 1849, the beautiful entablature of this palace was the only object of art that was injured. The chief hall of the Baths of Diocletian, Michael Angelo converted into a church. Both the church and a conventual building connected with it, which rests on a hundred columns of white marble, have a loveliness heightened by the simplicity to which Michael Angelo was so often unfaithful.

The finest equestrian statue remaining to us from antiquity, that of Marcus Aurelius, Michael Angelo placed on an elegant pedestal. But his restoration of ancient statues, such as the Dying Gladiator, the River God, and so on, have not been pronounced successful. The so-called Farnese Hercules had been found without legs. Michael Angelo undertook to supply the defect. But as soon as the real legs were discovered, their superiority was at once evident.

Of pictures belonging to this period of Michael Angelo's career, one of the most notable is the "Three Fates" in the Pitti Palace. But it is said that many pictures which were attributed to him were only executed from his designs, while no doubt many which he really executed have been irreparably lost.

The immense, the inexhaustible productivity of Michael Angelo in every direction, is illustrated in the number of his drawings. There are more than two hundred in the gallery at Florence. At Paris, at Cremona, at Perugia, at Venice, and elsewhere, they are found in like abundance.

Having nearly completed his eighty-ninth year, Michael Angelo died on the 17th of February, 1564. A slow fever had hastened the effects of old age, of toil, of anxiety, of despondency, of disenchantment. On the approach of death he made his will in these few words: "I leave my soul to God, my body to the earth, my property to my nearest relations." It has been observed that two days before Michael Angelo died, Galileo was born, as if the one great Tuscan were to continue in science the miracles which the other great Tuscan had performed in art.

None of the portraits of Michael Angelo are considered quite authentic. Nor is a bust of bronze at Rome deemed more trustworthy. But his enthusiastic disciple,

Vasari, has left a vivid description of him. According to Vasari, he was of a healthy and vigorous constitution. In his childhood he was often unwell, and at a later period he had had two serious illnesses. But he was capable of bearing excessive fatigues. He was of middle height, well-proportioned, and had broad shoulders. Toward the end of his life he wore, for whole months, dogskin half-boots on his naked legs. His head was round, the brow was square and spacious, and cut by seven straight lines; the temples were arched; the ears were rather large, while the eyes were rather small, and in colour inclined to grey. The lips were thin, the under one slightly protruding. To black hair, a black beard corresponded, which was forked, and not very thick. Altogether a robust, compact organization, fitted for action and for victory.

The lamentation of Rome for the death of Michael Angelo was sincere—was not transient, or theatrical. With great pomp his body was borne to the Church of the Holy Apostles. It was the intention of the Pope that a monument should be raised to Michael Angelo in the Church of St. Peter. But Cosmo I. resolved that Tuscany should not be robbed of the ashes of her gifted son. At Cosmo's request, therefore, Leonardo Buonarroti, the nephew of Michael Angelo, had the body secretly conveyed away from Rome, disguised as a bale of merchandise. On arriving at Florence, on the 10th of March, it was first placed in the Chapel of the Assumption, then, the following night, by the light of countless torches, and accompanied by a vast multitude, conveyed to Santa Croce. There the coffin was opened by the vice-president of the Academy, and the pale, but unchanged countenance disclosed to the wondering, adoring gaze of the spectators. The Florentine artists determined to pay the most cordial and ungrudging homage to him whom they revered as their chief, and they appointed a commission to make the needful preparations. On the 14th of July, in the Church of San Lorenzo, the funeral ceremonies took place with a prodigality of decoration and a pomp such as have seldom been seen even when kings are given to the grave. It was not, however, in the Chapel of San Lorenzo, but in what has been named the Florentine Pantheon, the Church of Santa Croce, that the remains of Michael Angelo found their last resting-place. The monument to Michael Angelo in this church was erected by his nephew, Leonardo Buonarroti. It was designed by Vasari. On the sarcophagus is the bust of Michael Angelo. Among the ornaments are three crowns, interlaced, symbolizing the three arts in which he equally excelled. There are also three figures representing those three arts—Painting, Sculpture, and Architecture.

Another monument at Florence consecrates Michael Angelo's memory. In the house which he inhabited in the Strada Ghibellina, his grand-nephew, also called Michael Angelo, constructed a gallery, whose contents and ornaments were designed to recal circumstances of the artist's life, and features of his character. In the gallery and in the neighbouring rooms are sculptures, drawings, and manuscripts of Michael Angelo; a sword, and some articles of furniture which belonged to him; his portrait by

Bugiardini; his statue by Antonio Novelli. At the foot of the Capitol can still be seen the house in which Michael Angelo died. It is of moderate dimensions; but its elegant vestibule and picturesque staircase have been admired; and the admirers have endeavoured, by drawings, by paintings, by engravings, to make its appearance familiar beyond Italy.

The poems of Michael Angelo consist chiefly of sonnets and madrigals. Some of them had been published while he was alive. In 1623 the grand-nephew already spoken of gave a complete edition of them, which has been frequently reproduced. They have all been translated into French; and translations of the most remarkable pieces have enriched other languages. Aretino declared that the poems of Michael Angelo deserved to be placed in an urn of emerald. The Academy De La Crusca decreed their classical perfection. They bear the stamp of Michael Angelo's massive and masculine mind; but they are the utterances of his softest, tenderest moods, of his resignation; and with the plaintive, sometimes blends the humorous. They were written at moments when he was glad to forget the artist who startled or enchanted mankind, and to show how deep and loving was the heart which beat under a rugged breast, seemingly inaccessible to everything but fame. They have an autobiographical interest apart from their poetical worth, bringing us near as brothers to him of whom we are not ashamed to be the worshippers.

But Michael Angelo wrote prose quite as well as he wrote poetry. He left dissertations on various subjects of art and philosophy. His correspondence also was extensive with princes, cardinals, artists, and literary men. He proposed to write a treatise on the various movements of the human frame. His knowledge of anatomy, his long experience, his acuteness, his ingenuity, his comprehensive grasp, would have made this treatise of incalculable value to artists.

There has sometimes been a dispute whether Michael Angelo should be classed among misanthropists. He seemed often to despise, often to shun mankind. But it is probable that he sought solitude for the sake of concentration. Having beheld also the gradual decline of freedom in Italy, he perhaps felt that art, however glorious, was a poor compensation for national decay.

Michael Angelo has been compared to Dante. In both, by the side of a Titanic energy there is a pedantic display of learning, so that it has been said that Dante was more a theologian than a poet, and Michael Angelo more an anatomist than a painter. They resemble each other also in their love of the horrible. But Dante is wearisomely monotonous; Michael Angelo has the infinite diversity of Nature. The mind of Michael Angelo was as prolific as it was potent; the mind of Dante was potent only. Art, however, was as little pure art in Michael Angelo as poetry was pure poetry in Dante. The poet and the sculptor alike took a polemical attitude towards their age. They were filled with indignation; they burned with prophetic fire; their creations were protests and anathemas. Genius demands genial and congenial environments; or it

demands the fortunate temper which is almost a second genius, that can build up those environments. Shakspeare was a pure poet, Raphael a pure artist. Milton, like Dante and Michael Angelo, was tormented by the wrath at wrong, at violence, at degeneracy; and like them he abandoned himself to moral fervours, often moral ferocities, which troubled and darkened his phantasy. It is not the ethical, it is not the heroic in connexion with art, which we condemn, but the antagonistic. As a hero we applaud, we have applauded, Michael Angelo; in his absolute discord, however, his grim wrestling with the social and political condition of his times, we miss that radiant strength which deserted not even Prometheus in the loneliness of the Caucasian rocks.

We may divide Michael Angelo's life into periods, and we shall find that a different spirit animated each. In the first period he was disciplining himself for the mastery; he had the joy, the serenity, we may even add the simplicity of the artist. In the second period he was the Master: he asserted, he maintained his sovereignty with ease; he expended, by an irresistible instinct, an opulence of vigour. In the third period he was more the despot than the master; he despised rivals, yet was, to a certain extent, jealous of them, and he tried to surpass them, to crush them, not by spontaneous artistic superiority, but by gladiatorial displays, with a dash now and then of legerdemain, a legerdemain, however, in which there was no quackery. In the fourth period there was a great spirit, flashing undimmed, unvanquished, through a cloud of dejection. Here the will was made to do what genius had done at an earlier day.

Though Michael Angelo excelled in so many things, so that he could pass from plans for Roman gates and Roman fortifications to an immortal idealization in marble of the Virgin and her Son, yet it is manifest that it would have been better if he had consecrated himself wholly to sculpture. This was his natural vocation. And through his fidelity to this, the harmony between the artist and the man would never have been broken. He would still have been the hero, but the hero glad and genial, and he would have consoled us by numberless statues and groups of statues for the buried marvels of antiquity, of which, when the smallest fragment is found, a mutilated limb, a headless and limbless bust, it is considered in itself a treasure for a museum.

The influence of Michael Angelo on Italian art was disastrous. A false taste for the grandiose and the exaggerated arose. The art which conceals art gave place to the ambition of climbing through the erudite to the monstrous. Not yet had the sun set: but it was going down in a lurid sky which red and angry gleams rendered more lurid still. The Titans had scaled Olympus and dethroned the Gods, and then pigmies dethroned the Titans, and tried in vain to wield their weapons.

But Michael Angelo was so truly a foremost man that we feel as if it were almost a crime to criticise him. Let us rather be grateful that Nature, at intervals however long, produces mighty ones like him. In the art, in the poetry of all ages, we cannot find twenty of our race to

be his companions. Nearly everything which he produced is perishable. Yet, even if his works of art were every one to vanish, even if nothing were to survive of the incomparable artist but the name, there would still be the inspiring memory of the patriot, of the hero, of an energetic soul that could defy despair itself. And even they who care nothing for art, even they who condemn it, may gain valour and panoply from commune with the colossal career of Michael Angelo.

THE ART OF DECORATIVE DESIGN.

BY C. DRESSER, PH.D.

AN inquiry into the character of the ornamental arts is always attended with difficulty, since it resolves itself into an investigation of the beautiful, and beauty only exists relatively. We may say that beauty is that quality of an object which gratifies or delights the soul of the beholder; but here, at the onset, we are met by an obstacle, as that which gratifies one mind is unwelcome to another, and the form which to one individual is pleasing is to others without comeliness. This diversity of opinion respecting the one thing is not peculiar to decoration, for it has its counterpart in all the æsthetic arts. In music, sounds which to the ear of the savage are grateful, are discordant to the more refined musician; and in respect to taste, that which is palatable to one is nauseous to another. The satisfying, then, may be rude, or it may be chaste: if an object, it may be clumsy in form, or refined in shape, and in colour, gaudy or subdued; and if sound, it may be sweet and tender, or harsh and crude; hence, if beauty is that quality of an object which delights the soul, it is of variable character, and the same form which is beautiful when viewed by one individual is not beautiful when viewed by another; for in the one case the mind is gratified, and in the other offended.

The taste, like the hand, is susceptible of cultivation. The child who cannot hold the pen, ultimately writes; and with the taste, that which is nauseous to the infant is frequently palatable to the adult; and that which the uncultivated cannot appreciate, the connoisseur greatly relishes. It is so in respect to sounds, and it is so in respect to forms; for shapes and sounds which are unwelcome we learn to admire.

Beauty, then, in the case of the individual, is constantly undergoing a progressive change. It is like the plant which alters its form as it unfolds itself, or the child which is ever undergoing mutation as it develops into man: it changes in the history of every individual who is the subject of cultivation, and passes through many phases in the experience of each; for that which appeared to be beautiful last year does not appear so this year, and that which we cannot now appreciate we may value ere long; yet the constant advancement towards the perfect ideal will not here apply, for our conception of the perfect not only daily alters, but differs in the case of two individuals: hence, it cannot be conceived of, and we cannot be said to be ap-

proaching this one goal; nor can it be said of any individual that he now knows what beauty is.

Beauty has also been defined as that which arises from the absence of any want; but here we have a difficulty similar to that which we have already encountered; for where one individual feels no want another sees a deficiency, and that which to one is perfect appears fit only for a part to another; and we know of no definition of beauty which is not associated with like difficulties; indeed, it cannot be otherwise, for the most careful and prolonged consideration only leads us to join Schleiden in thanking God—not because He has made the world and the things that dwell on it beautiful, but because He has placed in man a soul capable of creating to itself beauty, when perceiving the objects with which it is surrounded.

Recognising the truth that there is no such thing as the perfection of beauty, and taking cognizance of the fact that two individuals may differ in respect to the æsthetic qualities of a form or composition, we yet find that a class of men have existed in nearly all ages who have diligently cultivated that faculty of the mind from which beauty springs in the direction which meditation and reason have dictated; and in the works of these men general principles prevail, and the recognition of common laws is manifested.

These inquiries into the nature of beauty will be of value in respect to our following considerations, for they enable us to see more clearly the extent to which we may go, the nature of the investigation before us, and the conclusions which we may hope to reach. We cannot discover the laws which govern the production of the beautiful abstractedly, nor the road even, which conducts to a knowledge of perfection in form, nor can we refer our opinions to an infallible test for confirmation or refutation; all that we can do is, procure the judgment of those who have devoted long years to such researches, and examine into the practice of ages in which art flourished, being nursed in the arms of tenderness.

We inquire, then, into what is necessary in decoration in order to satisfy the cultivated mind; and first it may be remarked, that the ornamental composition, of whatever character it be, must embody the mind of its producer. The most exalted gratification of man rests in the power which his spirit possesses of communing with other spirits: to this faculty of interchanging thought man is indebted for half his knowledge as well as his greatest pleasures; and in the absence of this power the man would be comparatively uneducated, uninformed, unenlightened. This source of exalted pleasure can be embodied in ornament; for the man, while yet dead, may speak through his works. It is the mind which exalts man above all other creatures, and constitutes him a superior being,—it is this which enables him to subdue creatures of greater magnitude and strength than himself. Yea, the mind is the man; hence, if mind be absent from his works, the ennobling part is wanting, and they sink in consequence to mere mechanical productions.

Not only must mind be embodied in the ornamental composition, in order that it be satisfying, but the senti-

ments of the age in which it is created must also be acknowledged. In order that a work of any description gain sympathy, it must in some way personally concern those whose interest it is to awaken, for we can feel but little interest in that which in no way concerns us; and if decorative art is ever to be cherished by the people at large, it must draw forth their affections by embodying their knowledge. It is impossible that ornament do otherwise than engage the attention of the people, if it be a setting forth of the knowledge of the day of its birth; for if any are unjustly represented, they will not delay in expressing their feelings concerning the injury done them. What Englishman likes to see his countrymen represented on the French stage as antiquated individuals robed in blue coats adorned with lustrous brass buttons? The feeling of dissatisfaction at this misrepresentation has even made *Mr. Punch*, if not his dog, protest against such injustice in his amusing *Almanack*. If every ornament be a representation of some circumstance, or of our knowledge, we may be sure of popular interest; for if one party or theory be unjustly dealt by, its advocates would not be slow to say so, and if the one side were flattered others would find fault. Till ornament does express the sentiments of the age in which it is created, we can never hope that it will receive that constant attention and warm sympathy which it must have in order that it take up and maintain its just position.

In every age in which decorative art has flourished, it has embodied and expressed the sentiments or faith of the people. The Renaissance ornament was an expression of the Renaissance period; and the Mediæval forms, of the faith of the Middle Ages. What could more fitly set forth the Christian faith than the pelican pecking itself till its blood issues forth in order to nourish its young? The passion-flower, the cross, trefoil, quatrefoil, and many other forms, had each a class signification; so that the decorative forms were as mirrors reflecting the faith of the beholder, and they are yet as mirrors which reflect the same image of faith to us, though at a broad angle, as we are far removed by time from the period at which the faith of the Middle Ages prevailed. The Greek ornament, while without symbolic forms, speaks of the refinement which was so diligently sought and successfully attained by the people of the Classic age; and every form in Egyptian decoration had an acknowledged significance, which caused it to speak as clearly-written characters. Ornamental art, where it has flourished, has ever spoken the sentiments, knowledge, or faith of the people who have created it, and must again do so before it will draw to itself that sympathy which is necessary to its due advancement.

This brings us to inquire whether it is possible to express our knowledge in decorative forms. We argue that it is. Yet an expression of religious sentiments in a national system of decoration cannot take place; for, unless there is unanimity of sentiment, there can be no expression of faith. What must find utterance in a national system of ornamentation is our secular knowledge,—our knowledge of nature, as revealed to us

through the sciences, and of refinement; and it is the possibility of expressing this knowledge which we shall endeavour briefly to establish. Some will object that secular knowledge should never be embodied in the decoration of an ecclesiastical edifice, and that we do not admit the embodiment of religious sentiments. No one will more strongly object to a manifest embodiment of secular knowledge in the decoration of a building intended for the purposes of worship, than the writer of this article; yet we cannot approve of the appropriating Mediæval symbols, for the Middle-age faith has passed. We would have "the house of prayer" adorned with little besides the worshipper, as nothing should seduce us from worship while in the temple of the Most High; still we feel strongly that the Creator is worthy of being worshipped in the most exalted edifice which human hands can rear; yet, as He commands that He be worshipped in "spirit and in truth," we would rather, for our own part, not expose ourselves to the possibility of being seduced from true worship by ornaments such as the soul delights in.

While attempting to illustrate the possibility of embodying knowledge in ornamental forms, the author of this article must ask every indulgence, as he is not professionally engaged as an ornamentist, though at special request he has furnished many designs to the manufacturers which have been wrought for the International Exhibition—perhaps as many as any individual; yet, as he has to meet the requirements of an active scientific life, it cannot be expected that he present thoughts clothed in the best garb of decorative forms. He must content himself with giving forth a few ideas for others to clothe in the richness of their knowledge.

Ornament, we have seen, has long possessed the power of expressing feelings and ideas through the aid of forms having acknowledged significance; but, pleasing as this mode of expression by the agency of symbols is, yet the power of utterance thus afforded is limited. Orange-blossoms may set forth innocence, and call up reminiscences of Hymen's altar; holly and mistletoe will express Christmas and evoke thoughts of merriment and joy; the violet will typify humility, leaf-buds spring; a profusion of flowers, summer; ripe fruits, autumn; and leafless branches, winter. Yet the number of such symbols is few; consequently they afford no great means of expressing thought.

In order that a symbolic art be powerful in utterance, it is necessary that the people have cognizance of the purport of the forms used, and of the circumstances to which they have reference; for, in the absence of this knowledge, the decoration, through not being understood, ceases to be impressive.

Relative to the desirability of embodying knowledge in ornamental forms, all will be agreed, as we have seen, that such is necessary; yet we cannot hope that symbolism will again prevail, for to it there is the drawback that the significance of the form must be known, in order to an understanding of the ornament: hence the causing decorative forms to express thoughts, feelings, and ideas,

without the aid of recognised symbols, becomes of interest.

The most simple agency by which the thought of ascension can be called to mind, is by the arrow with its apex uplifted, and of descension by an arrow inverted (winged arrows will be most expressive); but the ideas evoked by such a use of this simple form are necessarily indefinite. In order that a sense of ascension and descension be more perfectly evoked, a more complicated mode of expression must be adopted, which shall be an embodiment of occurrences or effects associated by the mind with these acts. An umbrella, if moved through the air with considerable velocity in such a manner that the handle follows, will have its web pressed closely against the stick; a bird, when in rapid flight, has its feathers pressed against the body; a parachute during ascent is closed: but should the umbrella be pulled downwards through the air, it will be forced open; a bird when descending has its wings uplifted, and the parachute is open; hence these bodies, when in these particular conditions, will tend to induce the mind to originate to itself the thought of ascension and descension. As an illustration of what is necessary, in order to the awaking the thought of ascension and descension, we give these examples, which are of a simple character.

Our next idea is that of a "Hobgoblin," which is said to be a creature with eyes as large as tea-saucers, resident in Padfoot-lane. It will be found that we associate with our conception of evening the existence of creatures with luminous or terrific eyes; and insects generally impress by their eyes and wings; for although perfectly familiar with the organs of vision in these creatures, we are frequently altogether ignorant of the character of the mouth; and hobgoblins are associated with evening, hence it is necessary to link them with our conception of this portion of the day, and to make them terrific through the magnitude of the eyes.

In order to the delineation of "subjects" in decorative forms, or, rather, the production of ornamental compositions such as induce the mind to create to itself given thoughts, and call up the desired associations, it is necessary that an accurate knowledge of what has to be accomplished be obtained. If evening has to be induced, the colour of the evening sky must be discovered, which is difficult when a flat-tint is used; and the changes which colours undergo as twilight advances must be carefully observed:—blue becomes lighter, even considerably so; red darkens, and during the period of the later dusk is dark maroon. Yellow is, of all colours, the most stationary under these circumstances. Not only must these things be noted in respect to colour, but the integral parts which go to make up our conception of evening must be ascertained and made use of. Mushrooms, owls, stars, the moon, and large-eyed monsters, all combine to produce the sense of evening; hence their presence, or the presence of conventional forms which suggest them, is desirable, if the intention be that of impressing the mind with the thought of departing day.

We instance these few examples, in order to show the possibility of setting forth thoughts and occurrences in

conventional forms. We might select many others, but space will not permit us so to do. In all cases pictorial illustrations should have colour, yet we hope that this written description will manifest the possibility of ideas being expressed by conventional forms without the aid of symbols.

ON THE RECENTLY ERECTED BRIDGES OF NORTH-WESTERN EUROPE.

BY G. R. BURNELL, ESQ.

WITH respect to the considerations of the artistic beauty of bridge architecture, it is hard to lay down any absolute laws or canons of taste; because the peculiar local conditions of every such work must exercise a notable influence upon their mode of construction, and upon the actual effect they are able to produce. At all times it should be the aim of the bridge architect to give a character of monumental solidity to permanent structures of this description, and to make them harmonize with the scenery around them, the buildings they may be intended to connect, or the economical purposes they are intended to fulfil. The nature of the materials furnished by a particular locality will, in its turn, greatly affect the style of the design, and sometimes considerations of strategy may require that a bridge should be constructed in a manner which would be objectionable under ordinary circumstances. The best lessons of the manner of dealing with these extrinsic modifying causes are to be found in the practice of the best artists of former times, and they will pass, with more or less detail, under review; but the general principles of bridge-building, as influenced by the laws of optics, being "not of an age, but of all time," must firstly call for examination in this series of articles. They are very simple; indeed, so much so as almost to render it unnecessary to repeat them formally; yet they have been violated so often of late, that it would almost seem as though they had been forgotten in the modern programmes of art education.

Mr. Ruskin, in one of his brilliant but paradoxical descriptions of the scenery of the Rhine, went out of his way to abuse modern engineers because they erected bridges with arches of equal openings over torrential rivers, that is to say, over rivers rolling down wide streams of water in the wet seasons, and narrow deep streams flowing only over a portion of their beds in the dry season. The eminent, but erratic, critic avowed a decided preference for the bridges which consisted of, *e.g.*, a large arch over the principal stream, and smaller ones in the occasionally flooded portions of the banks; and no doubt, in some cases, a bridge of this irregular character may be far more picturesque than a more uniform or regular character may be. But Mr. Ruskin was seeking to make a hit at the expense of a class of men of whose works he was in fact profoundly ignorant; for the reproach which may be most frequently urged against modern bridge-building is that the regularity of the openings is far too often neglected. The viaduct leading into Preston, that of Nogent-sur-

Marne, the viaduct over the Mersey, and many others, have combinations of arches of unequal spans, in order to meet the varying requirements of the ground, and of the rivers to be traversed, without much reference to the uniformity of the design. All these bridges, however, produce a disagreeable effect on the educated eye, because in works of art, order and proportion are required to produce harmony; and order, in these particular cases, can only be attained by the equality of the intervals respectively of the supports and of the openings. When there is a manifest reason for the introduction of arches of larger span than usual in a viaduct, it is excused precisely on the utilitarian principle; and the position those arches may occupy in the composition may have no reference to the ordinance of the whole without producing a repulsive effect, for the same reason. In fact, bridges, viaducts, and aqueducts are essentially works of utility rather than objects of taste, and in designing them it should be the principal object of the architect to express their purpose and their relation to the surrounding scenery, leaving all petty details entirely aside, and trusting for their effect to their simple outline and to their mass. The affectation of irregularity in the openings would be quite as objectionable as a sacrifice of any description to secure their equality; and the only rules to be observed in this matter are to adopt the most common sense modes of construction consistent with economy; but, at the same time, to recollect that in objects of sight, as in sounds, a recurrence of impressions repeated at regular intervals is an essential element of harmony. It requires, however, a certain cultivation of the intellect before this beauty of order and of harmony is preferred to picturesqueness of effect; and Mr. Ruskin's attacks upon engineers for the uniformity of their works is to be explained by his avowed predilection for everything romantic.

Admitting, however, that the design of every work of the kind under consideration should be made to vary in spirit according to local circumstances; and that, therefore, there is no reason why the arches of a long causeway, bridge, viaduct, or aqueduct should necessarily be of equal openings, we may proceed to observe that whenever a variation of the diameters of the arches is introduced, the leading lines of the composition should be decidedly broken, so as to show that the construction of the one portion is essentially different from that of the other. Mr. Locke, in the Mersey Viaduct, managed to divide his composition with remarkable skill, and even to bring the springings of his arches and the spacing of his piers so as to increase the apparent stability of his structure; again, the width of the piers (on the face) is made to vary in this bridge proportionally to the spans of the arches, and different materials are used in what may be called the causeway portion from those used in the portions over the river and over the canal, so that every part of this design tells its own tale consistently and distinctly. In the Boyne Viaduct this is not the case, and there is nothing to indicate the separation between the construction of the piers of the land arches and of the river lattice girders; or, in fact, there is nothing in the elevation to explain why the

arches cease at a certain point. Somewhat the same objection may be made to the elevation of the viaduct of Nogent-sur-Marne, for there is not a sufficiently marked distinction between the portions of the bridge in which the small arches occur and that wherein the diameters are increased; and in the Elster and Goltzschetal viaducts the lines of separation between the arches of different spans are far from being as distinctly marked as would be required to secure the harmony of their effects. One of the ugliest of these irregularly-arched viaducts is, without exception, the one over the Tyne, near Newcastle, and precisely on account of the absence of anything to explain the reasons for the variations of the arches; whilst the introduction of the springings of the smaller arches upon the vertical sides of the spandrels of the larger ones gives a very disagreeable, because unsound, appearance to the whole structure. In the Preston Viaduct, the separation between the composition in which the cast-iron girders are introduced from that of the series of small semicircular land arches across the alluvial plain of the valley, is tolerably well arranged; but there are few, if any instances in which varieties of arches have been introduced under one level line so well worth the study of the architect as the viaduct over the Mersey and the canal before mentioned.

Some years since, it was the fashion to admire the effect produced by the perfectly horizontal lines of the cornices and roadways of such bridges as the Neuilly, Waterloo, and Jéna; but although for the purposes of traffic it may be desirable to keep a roadway as nearly as possible on a level, yet it is a law of optics that every long, horizontal line appears to deflect in its length, and this is particularly the case when a series of flat, elliptical arches is introduced under it. All the three bridges thus named seem, when viewed from the river, to sink in the centre; and the effect of the gentle curve of the London Bridge is far more agreeable to the eye than that of the level line of Waterloo Bridge. No doubt; in the former, the species of climax produced by the curved line of the road is increased by the greater span of the centre arch, whereas at Waterloo Bridge all the arches are of equal spans; but this fact simply proves that, when the number of arches of a bridge is not very great, it is preferable to make their openings increase towards the centre, and to make the centre arch the most important part of the composition. These remarks must, however, by no means be considered to be of universal application, because in the cases of such rivers as the Loire, the Po, the Ganges, Godavery, Soane, &c., the width to be spanned by the arches is so great that it would be practically impossible to give the roadway the curvature found to be so graceful in the bridges over the Thames; but whenever, from the physical nature of the valleys to be traversed, it is necessary to adopt a series of elliptical arches of the same openings, and rise from one abutment to the other, æsthetically it is necessary to break the line of the cornice corresponding with the roadway by some lateral projections, or by some wider piers, dividing the series of arches into bays, so as to prevent the eye, when following the line of the cornice, from being directly

affected by the level line passing through the soffites of the arches at the keys.

In our last article, attention was called to the constructive advantages of occasional wider piers in a long range of arches; and the improvement they thus produce in the artistic character of a building may be cited as an additional motive for their introduction. The height to be given to any single range of arches must vary according to local circumstances; but experience seems to show that the clear height from the ground line, or from any horizontal strings or tie, should not exceed from two to two and a half times the diameter; beyond that height, the Roman system of staged arches should be adopted, although instances have been known in which the clear height has exceeded the one thus named. In the Lockwood Viaduct, for instance, the height from the surface of the river to the underside of the arch is more than four times the diameter; but the general effect of this viaduct is unsatisfactory, and it may fairly be questioned whether it possesses the elements of stability required for the viaducts of valleys exposed to violent hurricanes. In the Ouse Valley Viaduct, the height of the principal arches is above three times the span, without producing any disagreeable effect; but the introduction of the horizontal tie in the Beitzheim Viaduct, at the level of the springings of the arches, or at the distance of twice the opening from the ground, certainly gives it a more solid and satisfactory appearance when seen from below. In the viaducts with more than one range of arches it is preferable to make the heights of the various tiers diminish in the ratios of their heights from the ground—that is to say, to make the higher tiers less lofty than the lower ones; and in confirmation of this opinion we may cite the Pont du Gard, where it has been acted upon, and which is far more graceful in its effect than the Roquefavour Aqueduct, where there is no regular gradation between the heights of the various ranges of arches; or than the Caserta Aqueduct, where the gradation of heights has been reversed. The Chaumont Viaduct has its various tiers of arches in good relative proportions, and indeed it may be cited as one of the most satisfactory works of its class. It must, however, be observed in this matter, that there must always be a difference in the mode of treating long and lofty aqueducts from the one adopted for viaducts, because the difficulty of executing large arches without flaws or cracks in the masonry, arising either from the settlements of the building or from the contraction and expansion of the masonry under atmospheric influences, renders it undesirable to resort to arches of large spans immediately under the channel or water-way. Thus, in the Pont du Gard, the Roquefavour, the Spoleto, Montpellier, and Biscari Aqueducts, the uppermost ranges of arches are made much smaller than the lower ones; and necessarily their heights are also less. In road viaducts there is no special reason for this peculiar mode of arranging the arches, and therefore it is preferable to avoid anything which would produce the effect of increasing the apparent weight of the higher part of the structure.

The treatment of the outline of the piers of a bridge, or of a viaduct, is a matter of quite as great importance,

artistically, as the treatment of the arches and of the leading horizontal lines. At the present day there is a very marked tendency on the part of bridge-builders to neglect the study of this detail; and, as may be seen in the Saltash, the Bordeaux, Theiss, Chelsea, New Hungerford Bridges, the recent practice has been to execute the piers simply in the form of parallel vertical pillars. The optical effect of these parallel vertical lines is, however, to cause the piers to look larger at the top than at the bottom, and thus to produce a "topheavy" effect, particularly when the girders they support are of the very elementary parallel horizontal form now usually adopted. But even in arched viaducts or aqueducts, such as the Dee, the Caserta, Maintenon, Roquefavour, &c., the straight vertical piers look inelegant; nor can the introduction of pilasters on the faces disguise the original defect of the strictly perpendicular line. In many cases the piers are made to diminish towards the top by means of a series of sets-off—a contrivance which may produce a small economy in the labour of dressing off the face, but which is by no means so satisfactory in its results as the introduction of a regular batter in the piers. As a principle of construction, it may be observed, the superficial area of the piers of a bridge ought to vary in the various points of its height in proportion to the weight actually carried at the respective levels, and to apply this principle rigorously it would be necessary to give the piers a batter whose outline may roughly be described as forming a portion of a flat ellipse. And it precisely happens that this strictly logical outline is the one which is the most pleasing to the eye, if frankly and fairly shown, as in the case of the St. Germain's Viaduct, and in some of the best bridges of the Perronet school. Whatever mode of diminishing the apparent width of the piers may be adopted, it is, however, of the greatest importance that a distinct line of demarcation should be shown between the horizontal and the arched parts of the masonry; and for this purpose a bold impost should be introduced at the level of the springing of the arches. There are not many instances in which this precaution has been neglected (and the word *precaution* is used advisedly, because a properly executed impost performs the important function of distributing the weight of the voussoirs over the whole bearing surface of the piers, and it has thus a logical necessity as well as an æsthetical one); but whenever, as in the instances previously cited of the Lockwood and of the St. Germain's Viaducts, the impost is omitted, the elevation presents a very bald and unfinished appearance. In river bridges, and in positions where the piers are of considerable thickness, their picturesqueness is much increased by rustication the courses of masonry; but this observation ceases to apply when the height of the piers is considerable, because the effect of frequent and strongly-marked horizontal lines on a pier gives it an effect of weakness—or at least it gives to the elevation a want of repose, one of the most serious defects imaginable in bridge architecture. It is indeed for this reason that the introduction of columns upon the faces of piers, as at Waterloo, Blackfriars, or Kelso Bridges, is objectionable, and that the

panelling and other decorations of the piers, as at the Esk, Glasgow, Ballochmyle, bridges are essentially misplaced; in all the best examples these petty details are avoided, and Rennie's last and grandest work, London Bridge, may be cited as one of the finest illustrations of the taste which ought to prevail in such works.

In river bridges, it is almost always necessary to place on the fronts of the piers cutwaters, the best outline of which, in plan, is that of part of an equilateral spherical triangle presenting to the stream an angle of sixty degrees, the base being placed upon the line of the face of the arch. These cutwaters were made by Perronet at Neuilly, and by Nimmo at Limerick, rather ornamental; but the taste of any ornamental details in such positions is rather questionable, and the simple spherical tops used in London Bridge, &c., are certainly more consistent. In any case the caps of the cutwaters must be placed over the imposts of the piers, not splayed off below them, as in the case of the Godavery Aqueduct; and, indeed, in this instance the cutwaters were made with rectilinear triangular extremities, the tops of which are splayed off in so singular a manner as to give the arches somewhat the effect of standing on points. Perronet's celebrated bridges of St. Maxence and Brunoi have their piers terminated by species of columns, which enabled him to dispense with the ordinary cutwaters. This system, however, would hardly be applicable upon large rivers, or in cases where an active navigation is carried on upon a stream running with considerable velocity, on account of the eddies and counter-currents it would give rise to.

In dealing with the abutments of a bridge, a greater amount of ornamentation may be at times introduced than would be consistent in the treatment of the piers, provided that the ornamental details do not interfere with the solidity of effect of the portion of the abutment logically required to resist the thrust of the arches. In the Stoneleigh, Darleton, and the Chester Bridges, niches and entablatures were introduced with great success; and, indeed, in execution, those details are far more effective than they are in the drawings. But, as a general rule, it is preferable to preserve the mass of the abutment as intact as may be, and, above all things, to avoid cutting up the wing walls of the approaches by small arches, which do not agree in any way with the principal composition, as in the cases of the Victoria and Albert Bridges, near Windsor. Perhaps the best, and most consistent, ornament which can be introduced upon an abutment is a flight of steps, when communication is required between the higher and the lower levels; and the manner in which Mr. Rennie arranged the stairs at the London and the Southwark Bridges may be cited as models for this description of works. The abutments and the land arches of the Alma, the Dora Riparia, the Berne, Verona bridges, or even those of the old Roman bridge of St. Angelo, may likewise be cited as worthy of study; but very grave doubts may be entertained as to the propriety or the correctness of taste of the abutments of such bridges as the Cologne, Dirschau, or Britannia Bridge, in all of which there is an affectation of architectural treatment incon-

sistent with the position and uses to which it is applied. A bridge, we repeat, is essentially a utilitarian object; as such it should be simple, even to severity, and whatever ornament it may bear should seem to be inherent to the purposes of the structure itself. This is the more true, be it observed, from the fact that in the majority of cases the ornamentation of the bridge is never seen by the bulk of the people who use it as a means of passage, so that an outlay for the decoration of the unseen parts is practically a waste of money. These remarks must not be understood to imply a censure of the careful study or the artistic treatment of the various parts of buildings of this description; for all the observations hitherto made are based upon the supposition that it is desirable that a bridge should possess every attainable element of beauty; but that beauty should be derived more from order, harmony, and proportion than from elegant details—from the mass rather than from parts skilfully combined.

The treatment of the voussoirs and of the spandrels would, on the above principles, require to be simple, bold, and free from any affectation of prettiness. The outline of the extrados ought, we believe, to be distinctly defined; and we do not even much object to the introduction of a moulding on the face of the bridge to mark that line, provided it serve at the same time to protect the extrados from driving rains. Smeaton, for instance, was rather fond of placing a moulding on the supposed line of the extrados; but as his arches were usually of small spans, he was able to make the mouldings concentric with the intrados—a condition which would not hold in an elliptical arch of large span. Mylne in Blackfriars, and Mr. Rennie in London, Sir J. and Mr. G. Rennie in the Hyde Park bridges, have treated the jointing of the voussoirs and of the spandrels of their arches with remarkable skill; and indeed in this respect the practice of the best English engineers is superior to that of even such men as Perronet, Chézy, Hupeau, &c., for the French engineers of the latter end of the eighteenth century habitually made the depths of the voussoirs of their elliptical arches proportionate to the radii of the various parts of the curve, whereas Mr. Rennie and his followers decreased the depth of the voussoirs, from the springing towards the crown, in proportion to the tangential effort they had to resist. This arrangement gives an appearance of increased strength to the arch itself, and it certainly facilitates the combination of the horizontal lines of the jointing of the spandrels with the radiating joints of the voussoir, in the cases wherein the voussoirs are not circumscribed by a moulding. From the experience of some of the large bridges above mentioned, it would indeed seem to be preferable to adopt the former of these modes of treating the faces of the structure; because the introduction of the mouldings appears to detach the voussoirs from the rest of the work, whereas the combination of the horizontal and of the radiating joints gives to the whole a more homogeneous effect. Under any circumstances, the system adopted by Labeleye, in the old Westminster Bridge, of executing the spandril, filling in courses radiating from the same centres as the voussoirs of the arches, is to be

avoided; it is objectionable economically, constructively, and æsthetically, yet it has recently been followed in the Vale Royal Viaduct. As to the introduction of sculptural decorations upon the spandrels of the arches, local considerations must regulate its adoption; the only considerations of a general nature connected with it being, that it is essential that the sculpture should not appear to interfere in any way with the construction of the bridge, and that the subjects treated should be consistent with the positions in which they are placed. Thus, the trophies carved upon the spandrels of the Pont d'Alma, at Paris, really constitute ornaments to that bridge; but the gigantic statues of the representatives of the different services of the French army introduced upon the piers of the Pont de Solferino, notwithstanding the beauty of their mechanical execution, look sadly out of place; they are too real, too lifelike in their eternal fixedness to inspire other than discordant ideas. Again, the fluttering garlands, or wreaths, around the panels of the Navilly and Toulouse Bridges are decidedly inconsistent with a class of structures which above all things should present the appearance of solidity and mass; but the wreaths introduced upon the bridges of Namur, or of St. Michel at Paris, as certainly improve their effect, by giving, as it were, movement to the portions which otherwise might look bald.

Designedly the observations upon the form of the arches have been reserved for this part of the notice, because in the case of cast and of wrought iron bridges, the treatment of the arches and of the spandrels must have even a more marked relationship than is the case in stone or brick bridges. Now, the various local considerations of water-way, head-way, approaches, materials to be employed, so strangely modify the abstract laws of taste as applicable to the precise description of curvature to be given to the arch, that it would almost be impossible to discover reasons for the preference to be accorded to any one of them. Yet there are some optical laws connected with the combinations of lines which cannot be violated with impunity; such, for instance, as the objection to the introduction of an elliptical arch with a very flat radius of curvature at the crown under a practically horizontal line of cornice; or the introduction of a pointed arch of the later mediæval character—that is to say, struck from four centres—in similar positions, because in both cases the effect produced on the eye is that of a deflection over the crown. New Westminster Bridge furnishes marked illustrations of the former defect; the Victoria and Albert Bridges, near Windsor, of the latter; and the bridges of the Great Western Railway at Bristol may also be referred to as illustrations of the disagreeable effect resulting from the use of the pointed arch in bridges with horizontal roadways. Even in the viaduct at Coccaglio, near Verona, where the pointed arches are struck only from two centres, the effect is far from pleasant; and this form of arch only seems appropriate when the roadway is made to rise in the somewhat exaggerated way it does in the mediæval bridges of Martorel, or of Orense in Spain. With respect to the use of the segmental arch, it may be observed that when the segment nearly approaches the

semicircle, the effect is by no means pleasant; and in the cases of Smeaton's bridges of Coldstream, Hexham, Perth, &c., the appearance of the arches would have been greatly improved if they had been made semi-ellipses. Tredgold's Bewdley and Tongueland Bridges are liable to the same objection, and they also would have been much improved, without any material increase in their cost, if the arches had been semi-ellipses; but Telford was essentially a man devoid of taste, as appears, we may add, by the manner in which he spoilt Perronet's idea of the *corne de vache* arch in the bridge at Gloucester. This *corne de vache* arch, however, has been successfully treated in the bridge over the Dora Riparia, and in Nimmo's beautiful work at Limerick, which may almost bear comparison with the Pont de Neuilly itself: the new Pont d'Alma at Paris is another good example of this peculiar form of arch. As to the elliptical arch, the most important remark to be made is that when, from the necessity for securing headway under the haunches, it is desirable to make the first portions of the ellipse of large radius, the curve becomes ungraceful, and it is better to resort at once to the flat segmental arch. The bridges of Saumur, of the Bordeaux and Tours Railway, and Rennie's bridge over the Earn would, we believe, have been more agreeable if they had been segmental, than they are in their present form of flat semi-ellipses; but all arches whose upper portions are of large radii require to be skilfully treated, for the reasons before mentioned. In lofty viaducts, or aqueducts, the universal practice, since the days of the Romans, has been to use exclusively the semi-circular arch, except in the very remarkable case of the Spoleto Aqueduct, or in the Coccaglio Viaduct, no doubt on account of the smaller effort of the semi-circular arches to overthrow the piers.

Cast-iron and wrought-iron bridges, when the last-named material is used in compression, are generally made with segmental arcs, and the few instances in which this rule has been departed from by no means induce regret that it should be *the* rule. The section of the girders, or rather of the arched ribs, used in the earlier cast-iron bridges would seem, from Mr. Hodgkinson's investigations upon the strength of cast-iron, not to be very logical; and in some of the modern bridges—as for instance, in that of Tarrascon—an attempt has been made to arrange the transverse section in such wise as to obtain the greatest resistance with the least weight of metal. But this Tarrascon Bridge is by no means elegant; and as a matter of taste, the artist will always prefer the outlines of the Southwark, Laira, St. Petersburg, or Nevers Bridges to it. The Barnes and Windsor Bridges on the South-Western Railway, and the Trent Bridge, may again be cited as elegant specimens of cast-iron work, superior in this respect to the very useful and imposing structure of the High Level Bridge at Newcastle; but however these cast-iron bridges may differ amongst themselves in the order of their beauty, they all look more satisfactory to the eye than such structures as the Victoria Bridge of the Crystal Palace Railway, or than the still bolder Pont d'Arcole at Paris. It would require a long treatise to

discuss the constructive advantages and disadvantages of bridges in which wrought-iron has been, as in the two last-named instances, used in compression; but it may here be at once observed that the phenomena observable in both of them seem to indicate that their durability will not be very great. To the educated eye, therefore, this description of bridge must always be objectionable, for it never can convey the notion of sufficient stability; and to the architect, the attempt to carry out, in any description of metal girder, the picturesque style of the Middle Ages, must likewise appear a mistake, for the essence of the effect of mediæval arching consists in the depth of the splays, a condition which can never be truly attained when thin girders are used.

There is room for the display of much taste in the treatment of the cornice and of the parapets of a bridge, whether executed in stone or in metal. Good examples of bold, massive, dentil cornices, with solid parapets over them, are to be seen in such bridges as the London, or the Grenoble bridges; plainer cornices, without dentils, are to be seen in the Neuilly and the Limerick bridges, with block parapets in a continued unbroken line in the former, and with occasional breaks in the latter instance. In many of the modern English viaducts, and even in the elegant bridge of Namur, the profile of the cornices is by no means logical, for their designers have forgotten that the principal meaning of a cornice is to provide a protection for the wall beneath from rain, and they have positively made the profiles of the mouldings such as to lead the water down the face, instead of throwing it off. Under all circumstances, however, the cornice must be devoid of small details, which can neither be seen from above or from below; and on this score the shields in the cove of the cornice of New Westminster Bridge are objectionable. The parapets may either be formed with open balustrades, as at Westminster, Waterloo, Glasgow (Telford's), Old Blackfriars, Alma, &c., bridges; or with solid stone work, as (in addition to the instances already quoted) at the Hexham, Montfort, Newton Stewart, Toulouse, Tours, Verona, Dresden, &c., bridges. When the length of the parapet is great, there is an advantage gained, so far as the artistical effect is concerned, by breaking its uniformity by the introduction of projecting bays, carried upon corbels below the line of the cornice, which breaks round the projections in its turn. This manner of treating the parapets is well represented in the Ouse and the Brighton viaducts, in the Goeltzsche, Elster, Schildesche viaducts; in the Solani, Lune, and Orbe aqueducts; in the London, Dresden, and many other river bridges; but all these projections must be confined to the portions of the parapets over the piers, and they must be carefully avoided upon the centres of the openings. In some cases, unfortunately, the heaviest portion of the parapets has been placed over the very centre lines of the arches (as, for instance, in the often quoted Victoria and Albert bridges), and thus the effect of loading the weakest part of the arch has been produced; this is very objectionable, because all ornaments introduced in bridge building, in fact, ought to appear in strict accordance with constructive truth, and surely no reason can be assigned for an

unnecessary weight over the crown of an arch. The parapets of iron bridges, it may be added, are usually made of open panelling, and it would seem to be more consistent to adopt this course than to employ a solid parapet, because the latter would hardly appear to be consistent with the open work usually employed in the spandril filling of these bridges. On some of the large canal aqueducts light iron panelling has also been introduced, but it is there out of place, and totally inconsistent with the solidity and heaviness of effect produced, by reason of the depth of the watercourse. The Guétin and the Godavery aqueducts furnish striking illustrations of this defective treatment of the parapets; the Orbe Aqueduct, on the contrary, may be cited as an illustration of the manner in which they may be made to contribute to the beauty of such works. Indeed, the Orbe and the Lune Aqueducts may be cited as masterpieces of decorative, and at the same time useful, bridge building.

The architecture of suspension and of tubular and lattice bridges of large spans requires to be treated on very different principles from those adapted to stone or brick bridges. Of the former, the Kieff and the Pesth Bridges are certainly the most worthy of study, on account of the skilful combination of the ornamental details with the masses indicative of strength and adaptation of purpose. The Hammersmith Bridge, also, is an elegant specimen of its kind, and its simple elegance contrasts strangely with the frittered affectation of the Chelsea Bridge. The bridge at Friburg, that of La Roche Bernard, and even the Niagara Bridge, are picturesque structures, deficient perhaps in some of their details, and unsatisfactory to the eye on account of the lightness of their suspension chains; whilst the Menai, Hungerford, Union, &c., bridges have only the merit of having stood the test of time. In the tubular and lattice bridges, the most successful instances of artistic treatment are, on the whole, those of the German lattice bridges over the Rhine at Cologne, the one at Durschan, &c., in which the piers and abutments have been treated as mediæval towers, rising above the lines of the horizontal framing in sufficient mass to form harmonious combinations with it, and yet to break the uniformity of the outline. The bridge at Kehl is a frightfully ugly attempt at the introduction of Gothic details of a light and airy character in such works. The Victoria Bridge at Montreal is utterly devoid of any attempt at the display of taste; and even in the Britannia Bridge itself, the effect of the mass has been relied upon more than the effect of the details. Perhaps this is the true principle of dealing with this class of bridges, because the elementary lines which enter into its composition are so simple that they do not admit of the introduction of ornament; and the only rules to be observed in designing such works are, that the outlines of the various parts should be such as not to give rise to unpleasant optical effects, and then that they should be as simple as possible. The Kehl Bridge is objectionable precisely on account of its attempts at decoration in positions where decoration is misplaced. Bridges are, in fact, essentially works in which the useful should be studied more than the orna-

mental; and in them details should never be allowed to obtrude themselves upon the attention of the general observer. It cannot too often be repeated, that the real characteristics of good bridge architecture are simplicity and repose. In small works they indicate that the end has not been made a vehicle for the means; in large works they are the only qualities able to produce the effect of sublimity. The tendency of modern practice in this branch of art is twofold—viz., either towards an entire neglect of all æsthetical laws, as in the case of the Victoria Bridge at Montreal and in the new Hungerford Bridge; or towards an affectation of prettiness, as in the Chelsea and the new Westminster Bridges. Both systems are wrong; and we may conclude these remarks by urging engineers—to whom the construction of bridges seems now to be exclusively confined—to return to the study of the works of Perronet, Rennie, Mylne, Hupeau, and of the giants of former days, who were wise enough to feel that architectural studies were essential to the successful cultivation of their particular branch of the arts of construction. No man who possessed even the rudiments of a cultivated taste could have erected such abominations as some of the more renowned modern bridges; and society has lost much by the strange divorce lately established between engineering and architecture.

THE DESTRUCTION OF CITY CHURCHES.

SEVERAL journals have lately called attention to the subject of our City churches. The *Building News* has an important article, from which we select the following judicious remarks:—

“Amid the bloodiest and darkest days of the first French Revolution there was formed a band—*la bande noire*—of speculative individuals, who assumed the utilitarian mission of converting into money, or to some purpose of practical utility, the architectural monuments which the piety or refined taste of their ancestors had raised, to the great embellishment of France. The Convention wanted money to equip armies as apostles to the rest of Europe of the Religion of Reason and as pioneers of French civilization; and the black band, in their patriotic anxiety to further these ends, offered their money in exchange for structures raised by a haughty aristocracy and fanatical priesthood—structures which could be nothing more than obstructions to the new light which the *Être Suprême* shed over France. So, under their black flag, inscribed *guerre aux châteaux, paix aux hameaux*, they went forth in bands, armed with sledge-hammers, crowbars, and pickaxes, and levelled to the ground cathedrals, churches, monastic structures, palaces, and mansions, where there were no other means of making money than from the sale of old building materials. In districts where individuals offered to purchase from *la bande noire* confiscated edifices for conversion to useful purposes, care was taken to destroy statues, carved armorial bearings, and artistic ornaments, in order to efface traces of the inequality and superstition which previously existed. From the northern provinces,

dotted with Flemish and the best French interpretations of Gothic art; through Normandy, with its stately feudal castles and masculine styles, uniting force and grace into forms of beauty; through the Valley of the Loire, where the pleasing works of the Renaissance stand on noble terraces sweeping down to the river; on to Limoges, where two styles of art may be said to have met on their way northward from the Lombard and Venetian cities of Italy and from the Moorish towns of Spain, the destroyers passed, leaving a broad tract of senseless, purposeless, and irreparable desolation behind them.

"The Convention—ignorantly indifferent as the members were to the opinions of posterity, and careless of everything that did not gratify their political passions—did not venture directly on works of destruction, although clearly responsible for the vandalism of *la bande noire*. In justice we should perhaps make a distinction between the Convention and the government of the Convention. If the Executive sold architectural works to ruthless destruction, the Convention, or some of its members, strove to preserve the artistic inheritance bequeathed by the past. An ex-bishop of Blois, a Conventionist, indignant at the degradations and destructions—for which he invented the term vandalism—perpetrated in the provinces, made several reports, and at last obtained decrees rendering the constituted authorities responsible for the preservation of national monuments and libraries. Of the buildings the Convention decreed national property and took possession of in the name of the nation, it did not openly proceed to destroy any, but converted them to some *quasi* useful purpose. In Paris, the Archiepiscopal Palace was united to the well-known hospital, Hotel Dieu, and the conventual structures were most of them transformed into hospitals. Such was the destination of the Abbey St. Antoine, of the Benedictine Convent Rue de Sèvres, of the Monastery Faubourg St. Jacques, of the Convent at Chaillot, the College Montaigne, the Convent of Val de Grace, and others. A Jacobin convent was transformed into an artillery museum. The Abbey of St. Martin was made the Conservatory of Arts and Trades, and the church is now a library. We scarcely remember an instance of the Convention pulling down a church, though it may have desecrated many. And it is, therefore, all the more surprising that what the Convention dared not do when its political and irreligious madness was at its height, should be proposed to be done in London, under the patronage of the Bishop, and when we are at the full flood of a religious revival.

"A statement has been going the round of the press, that the Post-office authorities have offered a sum, varying from 40,000*l.* to 80,000*l.*, for the site of the church of St. Mary Woolnoth, to construct the Lombard-street branch thereon. This structure will, therefore, if the parishioners consent thereto, be forthwith demolished, and will be the first church taken down under the Bishop of London's new Act, the twenty-second article of which provides that the proceeds of the "first sale of property or materials" shall be appropriated for the payment of expenses incurred, retrospectively or prospectively, in carrying

out the provisions of the Act; 'And the same fund shall from time to time be augmented by the Ecclesiastical Commissioners from the produce of similar sales of property as there may be occasion.' The written consent of the Vestry is necessary before the scheme can be carried into effect.

"Sentiment is, doubtless, excessively foolish; but there are few Englishmen—excepting, of course, Bishops and Ecclesiastical Commissioners—who can contemplate with indifference the destruction of an edifice consecrated to the worship of God, and wherein our fathers were baptised, married, and solemnly dismissed to the grave through generations of men. The desecration of the graveyard—God's Acre, as our fathers simply and reverently called it—is still more revolting to the laity. No consideration should be allowed to disturb the ashes of the dead.

"Although this may be a matter of sentiment with Englishmen, and they may feel that they would suffer almost any personal inconvenience rather than pull down a church or disturb graves, it may be admitted that there are cases in which such proceedings may be tolerated—we cannot say justified. But every case must be judged by itself, and not *en bloc*. Is there an excuse or necessity for the destruction of St. Mary Woolnoth? The excuse for the Bishop of London's Bill is, that in the City there are many churches without congregations; while, without the City, there are many congregations without churches. The City churches have rich endowments, and their sites are valuable; appropriate the endowments and prices of the sites of such churches as are unattended to the erection and endowment of new churches in the suburbs, says Dr. Tait. Certainly, the scheme looks very utilitarian—quite philosophical at first glance—but subsequent examination will show it to be the reverse. The first proposition of the advocates of the measure is that London contains nearly three million inhabitants and less than 500 churches, so 100 churches should be built. In this we may concur; by all means let us have the additional century of churches; but not old churches pulled down to build up new ones, for that would not alter the relative proportions of population and churches. Then, we are not sure that the figures represent the actual accommodation for religious worship. Turning to the last edition of the 'Post Office Directory,' we find there enumerated 334 Established churches and 77 chapels of ease, 104 Wesleyan chapels, 100 Independent chapels, 89 Baptist chapels, 84 chapels of other Protestant Dissenters, making the total of Protestant places of worship 782. To these must be added 31 Catholic chapels, 10 synagogues, 8 Quaker meeting-houses, 7 Unitarian chapels, and 2 Greek chapels, giving the grand total of places of worship at 840 for a population of 2,803,534, as ascertained by the last Census, instead of the figures stated by the advocates of church destruction and extension. The figures as given corrected may not show that ample accommodation for public worship is provided in the metropolis, but they do prove that it is not so deficient as has been represented, for they show one place of worship for every group of population equal to 3300 souls, instead of one for 6000.

"The history of church extension in the metropolis is well worth glancing at on the present occasion. When FitzStephen wrote, there were in London and the suburbs 13 conventual churches, and 126 lesser parish churches. Centuries later, when Stow compiled his 'Survaie,' the number he gave for total was the same, 139; of these 89 were destroyed by the Fire, and of them 35 were not rebuilt. This would leave 104, independently of the two cathedrals, at the close of Wren's labours. From 1680 to 1850 there were built, independently of those erected by the present Commissioners, 56 churches for new parishes and districts; and the present Commissioners erected, wholly or partially, 90 new churches up to 1850. Since then greater progress has been made, so that there is no room for charging the present generation with having neglected its duty in this matter.

"Granted that the population has departed from the City churches, and that new churches are required in recently formed districts, it does not follow that we should destroy what may now be unused. Before doing so—before resorting to so extreme a measure, we are bound to exhaust every other resource. The fabric of a church is not the property of a generation. We have only a life interest in it, and hold it in trust for those who may come after us. In common justice we cannot alienate it, unless it be in the interest of our successors. Were the number of churches within the City to be reduced to suffice the present resident population, there is no certainty the diminished amount of church accommodation will be adequate to supply the wants of the future resident population. There is just now a tendency to live out of the City; but, so far as the poor are concerned, that is because they are expelled. It is quite possible that a change may take place in the style of building, and that, as London grows larger, architects will give a vertical direction to the growth of London; that is to say, erect lofty houses of six or more stories. Should this occur—and there are not wanting premonitory symptoms of this change—nothing is more likely than that the resident population will augment. There will then be no church accommodation for them, and it will be impossible to provide it, except at very disproportionate cost. Under these circumstances, the destruction of City churches now will be an act of cruel injustice, of culpable indifference, having regard to the contingent requirements of the future. It is the duty of centres of population, where church accommodation is required, to provide it out of their own resources. Dissenters do so, and maintain their pastors without State assistance or legacies from the past. Classing them all as Protestant Dissenters, the figures quoted above show that they have built and kept up 377 places of worship, while the Establishment possesses no more than 405. Yet Churchmen, as a body, are wealthier than Dissenters. Are we, then, to suppose that their faith is cooler, and that among them the lamp of sacrifice burns feebler or is extinguished? We are fully prepared to admit the weight of the rejoinder about the difference in cost of constructing a chapel and a church; but when we have done so, that does not disprove the existence of energy and devotion

among Dissenters, and of lukewarmness among Churchmen. If the learning and eloquence of a brilliant episcopacy and priesthood cannot quicken the zeal of Churchmen for their faith to the length of making their sacrifices for church extension keep pace with the increase of their wealth, still we contend that church extension is not to be obtained by church destruction. With the recent examples of the munificent exertions of laymen in this direction—of Miss Burdett Coutts, the Misses Monk, Mr. Hubbard, and Mr. Beresford-Hope—the laity cannot be so torpid as it is made to appear. Its zeal would be quickened if the Church herself set the example. A belief is current that the revenues of the Church are ample to satisfy all existing wants, if properly administered. Laymen read of sees the holders of which receive princely incomes, and apply them to the enrichment of their families; of Church lands leased for inadequate rentals, that present incumbents may pocket large fines; and of other sources of revenue which are diverted from the service of the Church. A case in point has been just published, which, without assuming a personal character, will admirably illustrate our proposition with respect to the perversion or diversion of Church income. Finsbury prebendary is in the hands of the Ecclesiastical Commissioners, and yields an income of 7000*l.* a year. In seven years the income will rise to 66,000*l.* annually. The greatest exertions are now made to prevent this sum being applied to the erection of episcopal palaces, and to enhancing the rank and dignity of deans, while Londoners are without sufficient church accommodation, and are asked to demolish the monumental works of their fathers to supply the wants of new localities. The income of the prebendary it is sought from the Ecclesiastical Commissioners to have applied to provide endowments for fifty existing churches now without them, and for one hundred new churches to be built. This would leave a balance of 26,000*l.*—or interest, at 3 per cent. on a capital of upwards of 860,000*l.*—for the erection of the fabrics. Surely here are means to provide the requisite church extension, without imitating the Vandals of the French Revolution. Let the Commissioners announce such an appropriation, and the laity will not be backward in aiding the good work to the utmost of their ability.

"We have hitherto treated the question on general grounds, but if we narrow it to the case of St. Mary Woolnoth—and every case should be treated on its own grounds—the contemplated act of vandalism will appear particularly odious in an architectural point of view. St. Mary Woolnoth happens to be the *chef-d'œuvre* of Nicholas Hawksmoor, the favourite pupil of Wren; it was built in 1719. The exterior is original and bold, remarkable for the solidity of its appearance, heightened by deep rusticated work. If it does exhibit some trace of heaviness, it also shows an air of magnificence, combined with harmonious simplicity of decoration. The interior is effective and well proportioned, 'sumptuously beautiful,' and ornamented with bold and rich decoration, and the plan remarkable, withal, for classical simplicity

and harmony. And this is the structure which all critics agree in praising, and is one of the few architectural monuments in the City that is to be destroyed, under the sanction of the highest dignitaries of the Church.*

The *Clerical Journal* of September 12th says:—"The opposition to the scheme for the destroying the City churches, presumed to be useless, is, in our opinion, a good sign of the times. We have from the first expressed our dislike of the Act, both in its conception and its details, and we sincerely hope it will ever remain a dead letter. Removing a church because but few people attend it is a nineteenth century idea, only capable of being born in a mercantile and mercenary age. The church which the Bishop of London wishes to remove is that of St. Nicolas Acons and St. Edmund the King, of which the late Rev. H. Hartwell Horne was rector, and the living has not been filled since his death. It has been well said by a contemporary that 'it is, indeed, a matter of astonishment that the Bishop of London should propose to pull down a church where there is a steadily increasing congregation, whilst other and neighbouring churches, being literally deserted, are allowed to continue.' It was stated at the meeting held to oppose the measure that the site of a church in Lombard-street would fetch a fabulous sum of money (80,000*l.*); and as the Act provides that the proceeds of the first sale are to be devoted by the Commissioners, whose coffers are absolutely empty, to the defrayment of past expenses, it is easily intelligible why the removal of St. Edmund the King should be considered so desirable and necessary. The dislike of the movements of the Ecclesiastical Commissioners is intense on the part of the clergy; and the complaints made against the management of Church funds are both loud and deep, and we cannot but hope that their power will speedily come to an end."

ON MOVEABLE BRIDGES.*

THE subject of moveable bridges is brought before this Institution, not because anything very new or original is to be introduced or explained, but it is presumed that it will not be uninteresting to glance at some of the prominent features of such bridges, at some of the improvements which have lately been made upon their construction, and at the merits of each kind of moveable bridge in certain situations.

Under moveable bridges may be classed draw or lift bridges, swing bridges, floating or pontoon bridges, and telescope bridges; but at present the subject shall be confined to draw and swing bridges, which are the only moveable bridges adopted to any great extent in this country for permanent use.

At first, in crossing the ditches round fortresses, drawbridges consisted of a simple wooden platform, which was fastened at one end to a beam laid horizontally, and parallel to the sides of the opening to be crossed, or to the top

of a stone wall or abutment, by means of strong hinges. The platform was acted upon at its other extremity by levers, or by chains, worked either by wheels or by hand, and thus raised to the vertical position when necessary.

When ship canals were introduced into this country, about a century ago, it was requisite to have moveable bridges for all roads which crossed over the navigations. Drawbridges of a simple construction were often used for this purpose. The platform was generally divided into two equal parts, each revolving on a horizontal axis, and raised by means of chains passing over pulleys, which were wound up by wheel gearing. Afterwards, the back-balance was added, and which is now one of the principal features of a drawbridge. The equilibrium being perfect, friction is the only thing to be overcome in raising or lowering the platforms, and this is generally effected by means of a pinion working into a circular rack, which is fixed to the sides of the bridge.

Drawbridges are also used for crossing locks and dock entrances at many of our harbours; and some of them are of considerable dimensions.

The abutments of these bridges are generally of masonry. The chambers or wells for the counter-balances are sometimes formed by inserting into the stonework of the abutments cast-iron boxes; but these wells can be made perfectly water-tight by ashlar masonry set in hydraulic mortar. The platforms were at first nearly always constructed of wood, and afterwards many were made of cast-iron; but during the last ten or twelve years several large lift bridges have been constructed with wrought-iron girders and cross braces.

The drawbridges over the Forth and Clyde Canal, in number about forty, are from 20 to 22 feet in span between the faces of the abutments, and from 10 to 14 feet wide, the platform of each being in two leaves. The axles are of cast-iron, with sockets in front, into which the timber joists are fitted, and with arms behind, to which the back-balance is fixed. The axles revolve on cast-iron bearings, and each half of the bridge is raised by means of the gearing shown in the drawing. The timber joists are covered by two layers of planking, and the sides are protected by wooden fences. These bridges are very easily worked by two men; one on each side of the canal.

The drawbridge at the London Commercial Docks is 48 feet span in the clear, and was erected from a design by Messrs. Walker and Burgess, in 1853. The platform is also in two parts, each having four wrought-iron girders 43½ feet long, firmly bound together by cross wrought-iron braces and ties. A cast-iron axle 12 inches square is firmly fixed to them, and revolves in plummer blocks provided with brass bushes. Kentledge boxes are fixed to the landward ends of the girders, and between them, for the counter-balance, which is 10 tons in weight for each half of the bridge. The girders are covered with two layers of planking in the usual way, and the bridge is raised by the gearing at each side of each leaf, four men being required for opening the bridge.

Swing bridges are now extensively used at harbours, and for crossing inland navigations, both for roads and

* Read before the Institution of Engineers in Scotland, by Mr. D. M'CALL,

railways. The abutments are generally of masonry, but in many cases they are constructed of timber. The platforms of swing bridges, until lately, were usually of timber framing or of cast-iron girders, tied together and covered with planking. To the under side of the platform was fixed a cast-iron ring or roller path, and a similar ring was fixed to the abutment, the surfaces being inclined for the rollers. Between these rings were placed from ten to twenty conical rollers set in a cast-iron frame, or live ring, at equal distances. These rollers were generally from 6 to 18 inches diameter, and from 6 to 12 inches broad. The concentricity of all the rings was preserved by means of a centre pin. The rollers were usually of chilled iron, but sometimes of brass, and on them the whole weight of the bridge was placed. The friction was thus considerable, and powerful gearing, worked by at least two men to each leaf, was required to open and shut all bridges but those of the smallest and lightest description.

There are many fine examples of these bridges at our principal harbours, of large dimensions, and which reflect credit on their designers and constructors.

Swing bridges for roads were nearly always formed in two moveable leaves; but when railways began to intersect the country, it was necessary to modify or improve such bridges, so that a rigid platform for the passing train could be obtained in crossing the numerous navigations, for which it was essential to have head-room for masted vessels. To get this rigidity, swing bridges of one leaf have been generally adopted, and these have been made either of cast or wrought iron. The bridge over the river Rother, on a branch of the South Eastern Railway, is a good example of a cast-iron swing bridge, the girders of which are 112 feet long, each weighing 24 tons, and made up in four lengths.

The bridge near Falkirk, designed by Mr. A. J. Adie, for carrying the Stirlingshire Midland Junction Railway over the Forth and Clyde Canal, is an admirable example of a malleable iron swing bridge. In the former, the whole weight of the bridge is on sixteen conical rollers; in the latter, the greater part of the weight is on a steel ball, supported by a centre pivot; and the remainder of the weight is on conical rollers, with upper and under rings or roller paths. This bridge is easily worked by two men, and the platform is made rigid by means of four strong screws, which are turned by geared shafting. There is also a centre screw, by which the whole weight can be placed on the steel ball, and the platform adjusted. The ironwork and platform of this bridge cost about 1000*l*.

As in engine turn-tables, improvements have been introduced which have simplified and cheapened the construction of swing bridges, and have rendered the working of them easy and expeditious. The recent improvements are—1st, making the framework of wrought-iron instead of cast-iron, and thus reducing the weight of the platform, and correspondingly the back-balance. 2nd, putting the whole weight, or nearly the whole, on a centre pivot, capped with a steel ball, working into a steel socket. 3rd, having only four or six narrow rimmed wheels, with axles working in journals, and which are used merely to keep

the platform horizontal, instead of a large number of conical rollers. By these and other minor improvements not only is the friction reduced to a minimum, but the construction is much simplified and cheapened, for the live roller frame and upper roller path are done away with altogether, and bridges of moderate size can easily be worked by one man.

A swing bridge into which these improvements have been introduced has lately been erected from drawings made out by, and under the superintendence of, the author, for carrying the Twecher and Neilston Railway, belonging to Messrs. William Baird and Co., over the Forth and Clyde Canal, near Kilsyth. The clear span of this bridge is 25 feet, and the width of platforms 11 feet. The abutments are constructed of timber piles, tied and braced together, and covered with planking. On the south abutment are fixed the centre pivot, and the cast-ring or wheel-path, which is 11 feet in diameter. The moving platform consists of two wrought-iron girders, each 45 feet long by 2 feet in depth at the pivot, and 14 inches at the outer extremities. These girders are constructed of plates of angle irons riveted together in the usual manner. Over the pivot the girders are joined together by a strong cast-iron cross girder, made hollow at the centre to encompass the pivot. To the top of this cross girder, at the centre, is fitted a strong cap, into which a steel socket is fitted. This socket works on the steel ball, which is a hemisphere 7 inches in diameter at the base; and the cap is fixed to the girder by six 1½-inch screw bolts, by means of which the bridge can be raised or lowered a little for adjustment, and by which the whole weight of the platform can be put on the pivot. The longitudinal girders are further tied together by two cast-iron and three wrought-iron cross girders. To the ends of the cast-iron cross girders, along with the web of the longitudinal girders, the wheel bearings are fixed by screw bolts. The four wheels are of cast-iron, 18 inches in diameter, with rounded tiers 2 inches broad. The axles are of malleable iron 2¼ inches in diameter, and revolve in journals placed close to the main girders. The bridge is covered with planking 4 inches thick, and the rails are laid upon the longitudinal timber beams, which rest on the planking right over the girders. The bridge is opened and closed by simple gearing, the lower pinion working into a circular rack, which is cast upon a part of the ring or wheel track. The ends of the girders swing over the abutment plates and about 1 inch clear of them; but, to bring the platform to a solid bearing upon the plates, a wrought-iron wedge, 9 inches broad, which slides in a grooved frame fixed to the bottom flange at the end of each girder, is driven tightly in between the girder and abutment plate by means of handles, levers, and connecting-rods; and by the insertion of the four wedges the platform is made perfectly rigid. The bridge has a self-acting catch or lock to fix it when either closed or opened. The back-balance weighs 18 tons, and consists of square blocks of cast-iron, placed on the plates between the girders behind the pivot. A considerable mineral traffic has passed over this bridge during the last eighteen months,

and it has been found to answer the purpose satisfactorily. It is easily opened or closed by one man in sixty or seventy seconds. The moveable platform, including all the ironwork, cost about 800%, and the abutments about 470%.

It remains now to allude briefly to the advantages and disadvantages of draw and swing bridges in certain positions.

Drawbridges are very suitable for crossing the entrances and locks at harbours, where ground is limited and valuable, for all their parts are confined within the roadway, whereas in swing bridges, when open, the platform covers ground or waterway of its own dimensions, which may not in many cases be easily given up for this purpose, as at the crowded docks of London. Drawbridges are therefore still being adopted there, for besides the large one erected at the Commercial Docks in 1853, already referred to, and which has since worked perfectly satisfactorily, another wrought-iron drawbridge, 34 feet span, has been opened for traffic two weeks ago by the same engineers at the same docks. A similar bridge was also erected over the harbour of Great Yarmouth, 50 feet span, in 1854.

Several cast-iron lift bridges were erected over the entrance to the Hull docks forty-five years ago, and are still in good working order. At many other places they have been adopted with advantage. Their adaptability to dock purposes is worthy of consideration by engineers, where a large portion of the traffic, as in London, consists of barges passing out and in, in which case it is only necessary to raise the bridge a little to allow the barge to pass; whereas in a swing bridge, the leaf would require to be turned nearly full round, occupying much time.

However, in many cases, drawbridges are now being superseded by swing bridges. The principal advantages of the latter are the simplicity of their construction, the working parts being all above the abutments, and readily got at, and consequently more easily kept in repair; and their suitability for railway purposes, for drawbridges being nearly always in two leaves, it is difficult to make them rigid enough for a passing train; and for roads over canals or other inland navigations they are not so convenient or so economically worked.

At present, on inland navigations where drawbridges are in use, as on the Forth and Clyde Canal, one permanent bridge-keeper is sufficient for each bridge, the leaf on the towing-path side being raised by the horse-driver; but when steam-power on canals becomes universal, as is likely to be the case, two bridge-keepers will be needed to work each of the drawbridges, otherwise a man from the steamboat must leap ashore at every bridge for the purpose of raising one-half of it—a practice which will both cause delay and be dangerous.

The equilibrium of a drawbridge is often interfered with by surface water running into the counterbalance wells, and by the wooden platforms becoming soaked with rain or dried by the sun's rays. In a swing bridge the exact equilibrium is not of so much consequence, for any small over-weight on one end is easily borne by the wheels.

It may therefore be expected that the day is not far distant when swing bridges will take the place of drawbridges on all inland navigations on which moveable bridges are required; and even for harbours they are generally found to be better suited for crossing locks and entrances to docks and basins.

This subject has been brought forward so that the merits and demerits of swing and drawbridges may be considered and discussed, and not without the hope that the engineering knowledge and skill of many of the members of this Institution may suggest to them improvements which may still further simplify and economise their construction.

DESCRIPTION OF THE ILLUSTRATIONS.

THE LONDON BRIDGE RAILWAY TERMINUS HOTEL.

PLATES I. & II.

LARGE hotels are becoming as common in England as they have for some time been in America; and, judging from present appearances, are likely to go on increasing. On calling at one of those monster establishments the other day, we were informed that they had been unable to afford accommodation to one hundred visitors who had applied during a single week. They are paying large dividends to their fortunate shareholders, and must be a great convenience to strangers visiting London.

The London Bridge Railway Terminus Hotel has been built by a joint stock company, from a design by Mr. H. Currey, of Lancaster-place. The style is Italian, treated, however, with great originality, and adapted with admirable judgment to the situation in which the building is placed and the special commercial purpose for which it has been erected. The length is about 130 feet, with a depth of 95 feet, and an elevation of 110 feet. The edifice contains above 300 rooms, and is fitted with every convenience that can ensure the comfort of the visitors. The entire cost of the whole building was about 66,000%. The builders were Messrs. Lucas and Sona.

The Coffee-room, shown in Plate II., is considered one of the most richly-ornamented rooms of the kind in London. Indeed, one of the advantages of establishments of this sort is, that they combine the elegance of the club or mansion with the economy of an inferior hotel or lodging-house.

The materials used are a mixture of Bath stone and brick, and we may compliment the architect in having succeeded at a very moderate cost in erecting a building which is an ornament to the metropolis.

VIEW OF CROSBY HOUSE, BISHOPSGATE.

PLATES III. & IV.

THE visitor to London who desires to go to Shoreditch from the Bank will observe on the left hand, nearly opposite to the far-famed Crosby Hall, the building given in these plates. It is a fine adaptation of the Gothic style to street architecture, and seems to combine every advantage that can be desired for business purposes in a building of extreme simplicity and beauty.

The architect is Mr. Wilkinson, of Oxford. He has used throughout the very best materials, and we may congratulate him on having set an example of architecture to the Victorian Age which his professional brethren may study with advantage, and the public cannot fail to admire.

BEAUTY, in architecture, painting, and other arts, is the harmony and justice of the whole composition taken together.—BURROWS.

THE great use of the arts is to humanize and refine, to purify enjoyment, and, when duly appreciated, to connect the perfection of physical beauty with that of moral excellence.

'Tis use alone that sanctifies expense,
And splendour borrows all her rays from sense.

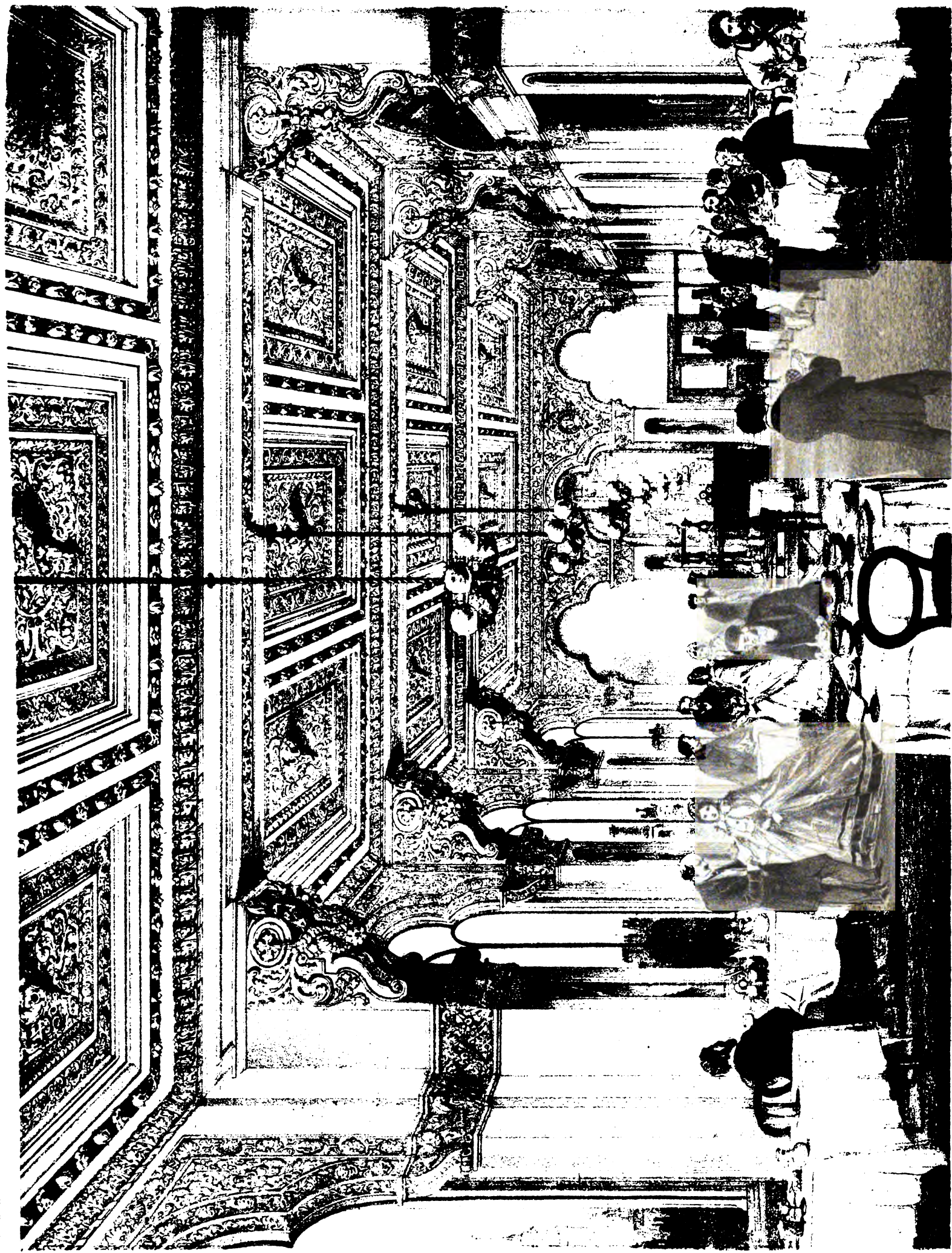


ROBERT DUDLEY, DEL. & LITH.

HENRY CURREY, ARCHT.

VINCENT BROOKS, IMP.

LONDON BRIDGE RAILWAY TERMINUS HOTEL.
GENERAL VIEW FROM THE APPROACHES TO THE TERMINUS



ROBERT DUDLEY, DEL. ET LITH.

HENRY CURRY, ARCHT.

VIRGENT BROS. IMP.

LONDON BRIDGE RAILWAY TERMINUS HOTEL.
COFFEE ROOM



ROBERT DUDLEY, DEL ET LITH

W. WILKINSON, ARCHT

VINCENT BROOKS, IMPR

VIEW OF CROSBY HOUSE, BISHOPSGATE.

DARTON & HODGE LONDON.



ROBERT DUDLEY, DEL ET LITH

W. WILKINSON, ARCHITECT

VINCENT BROOKS, IMP.

CROSBY HOUSE, BISHOPSGATE,
DOORWAY & LOWER WINDOWS.

DARTON & HODGE, LONDON.

HINTS ON DESIGN IN ARCHITECTURE.

BY E. H. HEPPER, ESQ.

THE excellence of any architectural design is in ratio with the amount of thought and study brought to bear upon it. This may also be said of other studies of a high intellectual order. It behoves us, then, to spare no pains in the production of our designs, so that they may be at once excellent and bear impress of deep and earnest thought. It has often been observed that "first ideas are best." Now, granted that they are, it would not be wise to make such ideas public in all their crudity and incompleteness, as, in all probability, they would not meet with that favour and recognition that they would otherwise have obtained had they been subjected to that scrutiny and afterthought so necessary to stamp them as originating in a lofty and cultivated mind.

How many architectural works do we see around that bear us out in this reflection, the designs of which are in many respects good, and, it may happen, very original, but, either from haste, inattention, or other causes, are not allowed to undergo the refining process by the mind of the architect necessary to rank them as works of the highest order of art. The student, therefore, should not spare any trouble in the preparation of his design, neither should he be satisfied with it until he has thoroughly studied and matured the whole, first collectively, then individually.

To carry out an architectural design successfully and complete in all its parts is no easy matter, but it may be done if the designer is determined, and he cannot make too great a sacrifice towards obtaining that reputation which is open to all, and should be coveted by those that are engaged in the profession. We cannot over-estimate the value of care and attention necessary to be bestowed upon any design that tends to raise it above mediocrity.

Architecture is peculiarly a public property, being brought before the eyes of thousands, and we should endeavour in every possible way to add to the beauty of our towns and villages by erecting buildings appropriate to their several uses, and agreeable and harmonious with their surrounding companions.

Seeing the necessity for being careful in the preparation of our designs, I must now say that, in the development of them, the first idea should not be lost sight of. It is necessary occasionally to make some departure from an original thought. Bear in mind, however, not to deviate too much, for then it may be stripped of all its freshness and originality. To an imaginative mind it is hard to curb the reins of fancy. This, however, must be done.

The façade of a building might be rendered admirable by the slightest alteration in the curvature of a window-head, by making the cornice deeper, or by the omission of certain features; but for the want of proper revision it is rendered objectionable to the eyes of skilful architects, and of dissatisfaction to others who are not competent to explain the cause of their disapproval.

It is convincing, then, that certain principles must be adopted to insure a successful result, and rules and principles, if made use of at all, must be capable of practical application; and I will endeavour to give a few hints on the subject of architectural composition for the guidance of the student, hoping they will be received as the result of some experience and great love for this branch of the arts. I do so with great diffidence, feeling that I am but a tyro myself; but if my paper should be the means of creating second thoughts, I shall feel repaid for any trouble I have taken in the preparation of it.

It matters little whether a building is to be designed after the Greek, Roman, Gothic, or Renaissance manner. Whether Venetian or Lombardic, Norman or Elizabethan, we shall, on examination, find ruling principles in all of them; and I am of opinion that the merits or demerits of any particular building rest not so much on the fact of its having been erected in this style, so much admired by one, or that style, deprecated by the other critic, but upon the presence or absence of principles that are indispensable to the perfection of every architectural structure.

Any design will be unsatisfactory and altogether a faulty one, no matter how pure a style you adopt, if you should violate the rules of composition; and a style not to be admired in itself—as the Chinese, for instance—might be turned to profitable account and made capable of many valuable suggestions, if infused with spirit and invention that is wanting in the other.

A great deal of valuable and instructive information has been written on the subject of architectural æsthetics, and Mr. Garbett's book, published by Weale, is one of the best of which you can possess yourself.

The subject of design is fully and carefully treated. In it you will find much to instruct, and there is a freshness and force in the treatment of the whole subject that rivets the attention and delight of the reader. I would recommend it to all. I have read it myself several times, and found much benefit arise therefrom. My paper is but a few hints in a practical way, just jotted down for reference. I do not pretend to set before you such a dish as the one I have just alluded to.

Every habitable building requires to be provided with an entrance, windows for the admission of light, and a roof for protection against the inclemencies of the weather; as warmth is also necessary, we must make provision for securing this end by building fire-places, the chimneys of which, if carried above the roof, afford the designer an excellent opportunity of exercising his taste and skill. So far as necessity is concerned, these are all the parts to be attended to in designing dwellings; but if means are not altogether wanting to render the elevation an object of pleasure and satisfaction to the eye, it is to adorn and enrich these features that the genius of the architect must be brought to bear; and the first thing to be considered in obtaining this end is "breadth"—not by lineal measure, but by the just proportions of solid or plain surface with void and shadow. This is, generally speaking, very difficult to be done, as the overcast and gloomy nature of our atmosphere requires the windows to be of considerable dimensions; this disadvantage tending to destroy that breadth or repose so very necessary to a proper architectural effect.

As a rule, then, if your design requires a large amount of window space, more than is proper for the maintenance of this quality, you must leave the walls as free from decoration as possible; only enriching the windows with small mouldings or a narrow architrave; and the cornice, with a small stringcourse and base moulding, would be found quite sufficient to satisfy the eye.

It is not good taste to introduce—I may say, squeeze in—a buttress or pilaster between windows or other openings closely set, thereby covering the wall space that would have been much better left perfectly free from any decorative feature. Yet how often do we see this done? The defect I have just alluded to is particularly glaring if the window-heads be straight and are closely set up to the cornice or fascia above, for then the elevation presents altogether a disturbed and uneasy appearance, the solid portions of it, as it were, being in the form of a cross, or chequered, and becomes nothing more than pilaster, cornice, and window. It would, indeed, be better to use curved or semicircular-headed windows; although they would not admit so large an amount of light, yet they would allow of a small portion of the wall to be seen, as the spandrels above them would be gained by this means, besides making a variety in the lines of the composition.

Coupled windows, if the plan admits of it, enable you somewhat to get over this crux, as you gain additional wall space; and not only that, you then reduce the voids one-half their former number, as each coupled window becomes as one, thereby simplifying the entire elevation, permitting you to treat them more elaborately, with wider architraves, than you could otherwise have done had they remained single.

Before I proceed any further, bear in mind that, if the proportions and positions of the general outlines in an architectural composition be not satisfactory and pleasing—if there are any radical errors and want of principle involved in it, then you had better not attempt to decorate or enrich it until you have carefully revised and corrected it, as any amount of subsequent adornment cannot rectify or make up for the want of this quality.

To insure breadth you can, as a rule, make the wall space between the windows equal in width to the windows themselves, but not less. This is, indeed, a good proportion where no buttress or column intervenes; but on the contrary, if one of these features is introduced, you must increase the space between the window and buttress sufficiently to prevent a shadow from the latter entirely covering the wall space and reaching to the windows.

Having spoken on the importance of preserving "breadth" in your composition, I will now touch upon the several parts of an architectural elevation.

The doorway—no matter whether the building be a church, or exchange, or dwelling—should be the most conspicuous and prominent feature in the façade, and it should always be designed and treated in a dignified and vigorous manner, as being the principal point of attraction. I am sure you will agree with me when I say there is nothing finer in architecture than the noble portals of some of our cathedrals and those on the Continent.

A doorway can scarcely be made too large; that this is perfectly

understood by the architects of the present time is evidenced by looking at the public and private buildings erected in this rapidly improving town within the last few years—a satisfactory contrast to the miserable and meagre entrances that were perpetrated during the two or three reigns previous to this one.

One important thing in designing a doorway (particularly if it be in the Italian style) is to give it a totally distinct character from the windows. We frequently see the head of a door treated in exactly the same manner and of the same shape as the window openings of the building, thus giving a long and disproportioned appearance, the extra height above the door (sometimes very considerable) being filled in with glass or ironwork. No light over a door should exceed half its width in height, unless it be a narrow one. The jambs should be built of a hard material, so as to resist any injury that they are occasionally (as in public buildings) very much exposed to.

The lower portion should be designed in a plain way, with few or no projecting members, or if delicate and enriched ones be adopted, take care they are protected by bold or plain parts.

As cornices do not seem to have been developed in Mediæval architecture, nor to have taken so prominent a position as to form an integral feature, as the cornice of the anti-Gothic styles, perhaps; in speaking about this important part of the elevation, I had better take my example from an Italian design.

Give your cornice sufficient projection, but do not, as a rule, let it project more than its depth, unless it be constructed of wood, in which case it may greatly exceed this, particularly if it is supported by boldly designed brackets; in this case, however, it must be treated as a wooden construction, and not to imitate the forms of one only suited for a heavier material, as stone.

As your elevation may perhaps depend a great deal upon the cornice for producing shadow, see that you make it do its duty; but above all, attend to the corona—this member is the principal one, and should be proportioned with great care, as it is the “echo” of the wall below, in the same way (as observed by Mr. Garbett) that the tenia, or astragal is the echo of the cornice. As an uninterrupted cornice of some length would present a monotonous and tiresome appearance if the lower edge of the shadow cast from it upon the wall underneath was not to be broken by the modillions or blocks, these necessary members must be introduced to produce a satisfactory result; and it scarcely matters how they are shaped where they are always in shadow, provided their faces catch the light, and by this means break the line of shadow below.

Cornices should always be accompanied by friezes, as they tend to grace and dignity; their use seems to be to blend and harmonise the cornice with the wall, and are, in my mind, quite indispensable to a good effect.

If no architrave and few members are introduced below the frieze, it can be made much deeper than if accompanied by those features, and if slightly advanced from the general wall line of the building an improvement will follow.

The cornice or upper member in the architecture of the Mediæval Period, although very different in its application, seems to possess the same guiding principles as in other styles. As it is, with rare exception, stopped by the buttress rising up at the division of every bay, it is not so requisite to introduce blocks or pateræ to take away a monotony, but at the same time is much improved by those decorative features, as the shadow cast from them into the hollow at the back produces a fine contrasting line, and enables us to judge of its contour.

The Gothic cornice is frequently designed with a smaller member running below and parallel with it, which is as indispensable as the tenia in the other styles, unless the cornice includes a large cavetto, turning out at the lower edge and producing the echo.

We thus see that whatever style we adopt to decorate our buildings the same principles must be carried out in every case. We must have in the cornice the deep contrasting shadow cast upon the wall beneath; we must have the corona, with the cymatium above; and, for the perfect satisfaction of the eye, some small projecting member to break the outline of the corona's shadow. The importance, then, of bestowing great care in the proportions of this essential feature of architecture is, I think, felt by all painstaking architects, and a paper exclusively devoted to it might be written at some length and listened to without weariness.

The basement is perhaps not thought to require so much attention as the other parts of a building, for we see many erections that are faulty in this part; but if we give a little thought to the subject, we

shall see that it is a very important one. Small feet may be considered a beauty by the Chinese, but a meagre, weak-looking basement is in no way to be accounted beautiful.

Now it is almost impossible to give too great importance to this essential feature in architectural design, and therefore study to preserve to it due boldness and freedom of treatment, but taking care to avoid coarseness. Restrictions are imposed by building acts that interfere somewhat with the carrying out of all that could be wished in designing a good basement. In the crowded thoroughfares of our towns it is sometimes almost impossible to give due importance to this feature, but, by ingenuity, a great deal may be effected.

In church architecture (as a considerable space is usually left free around the edifice) you are not so trammelled, and you have scope to produce a prominent basement; but in all cases it is right to design the several parts so that they may not be liable to receive any injury by getting knocked off or disfigured by passers-by.

To judge of the value of the basement, we have only to compare the building of the Oxford University Museum, designed by Messrs. Dean and Woodward, with the Liverpool Collegiate Institution, by Elmes; or the New Palace of Westminster, where the Victoria Tower may be seen—one of the noblest designs conceivable—not intruding upon the eye of the spectator, but worthy to bear above its glorious burthen.

I may add that the introduction of window openings is to be avoided, as it materially weakens that stability of effect that true architecture should always possess.

On the subject of shadow, much I feel might be written, as it affords a very large field for thought and study. I am aware that a great deal has been said regarding this subject already, but it seems as if the attention that could be brought to bear upon it were unlimited, and I am therefore sorry that want of time will prevent me from doing anything but touch upon this part in the study of architectural composition.

In the first place, to bring good shadows you must design good members and projections, both in the plan or general outlines of your building, also in the chief features, and lastly, the mouldings; and bear in mind that an over-proportion of shadow will destroy “breadth,” as well as create confusion by a multiplicity of lines and decoration. You must therefore spare no pains in drawing out the details of your building, taking care to judge aright the quantity of shadow each projecting member will cast below, and above all, see that the profiles of them are gracefully and chastely drawn. It is a very common error to hurry over this part of the draughtsman's work, the general arrangement and disposition of the plan and the construction taking the most prominent place and attention; and frequently details are drawn out at a few minutes' notice, whilst a workman is waiting, which, when reproduced in stone, timber, or whatever the material may be, appear faulty, and a source of great annoyance.

The value of cast shadow (or that which is produced by one object that falls upon another), seems to be much appreciated at the present time, and is often carried to great length, square-faced and sharp angles being very often introduced, and even the ornamental portions are designed to give a crisp effect; but the extreme is to be avoided, as a harsh and unpleasing appearance is produced, robbing the horizontal lines and severe parts of your design of their proper value, yet adding no grace. The production of forms, other than simple geometrical ones, does not give a satisfactory result in flat-faced ornamentation.

As a right idea cannot be always formed of the effect certain portions of architectural detail may produce when executed and placed in position, if they are drawn out in the office, it is much better to do this at the building, as a far more satisfactory idea can then be had; and, if possible, small pieces should be worked, or run in plaster, and fixed at the proper height.

No full-sized detail should be drawn out from the small plans until a drawing to a medium scale be first produced, say 1 inch or 1½ to the foot (the latter is the best, as the parts are easily measured off with a common rule), as it will generally be found necessary to modify or alter some of the members, for it often happens that the design has a coarser appearance when enlarged; therefore this gives you the opportunity of refining it, and will ultimately be a saving of time and trouble in the preparation of the full-sized details.

A NEW court-house is about to be built at Dumfries. It will cost about 6500*l.*, and will be built in the Franco-Scottish style.

’Tis not a lip or cheek we beauty call,
But the joint force and full result of all.

ANTIQUE VASES AND MURAL DECORATIONS, AS ILLUSTRATIVE OF ARCHITECTURE.

THE number of details of plan and ornamentation in the architecture of the ancients, and points of history, which require elucidation, is very considerable. We do not even yet know how the Parthenon was lighted; there are different restorations of the polychromy; and we are not certain about the arrangement of the internal columns. Respecting the *scene* of the ancient theatre much is wanting: the design of the Mausoleum is not admitted to have been reproduced; and the dates, localities, and modes of origin of the *orders* are not completely unveiled. The insufficiency of remains of the ancient buildings to afford the desired information leaves great importance to such researches as those of Professor Donaldson. Quite as valuable as medals, probably, are the mural paintings, as those of Pompeii, Herculaneum, and Rome, and the paintings on terra-cotta vases. To this subject, including that of the decoration of the exteriors of temples, Mr. Hittorff, as well known, has given much attention. A *mémoire* by him will be found in the second volume, published in 1830, of the "Annales" of the Archæological Institute of Rome; and his elaborate work, "Restitution du Temple d'Empédocle à Sélinunte, ou Architecture Polychrome chez les Grecs" (Paris, 1851), will be in the recollection of our readers. Mr. Hittorff has lately made, at the Academies "des Beaux Arts" and "des Inscriptions et Belles-Lettres," a further important contribution to his subject, under the form of an Essay on the Ancient Paintings, in their relation with architecture, and especially on a painting at Pompeii which presents the prototype of the most remarkable tomb of Petra, the ancient capital of Arabia Petrea. The author has entrusted us with the original essay and drawings; and though we cannot give a complete translation of the one, or a reproduction of all the illustrations, we proceed to note the main points which he has brought to light, and shall engrave some of the drawings to accompany a second article on the subject. It will be understood that we are giving a summary of Mr. Hittorff's investigations and conclusions, unless otherwise made apparent, in what follows.

The painter's art in the decoration of public and private buildings of the Greeks and Romans comprised a great number of different forms of treatment. Without speaking of all, three grand categories may be distinguished. First, there is decorative painting, properly so called. This consists of compartments, constantly varied, strewn with flowers and fruits, and figures of men and animals; and also offering charming architectonic inventions, in which the real monuments are transformed into fanciful edifices, where the innumerable colonnades and porticoes are composed of the thinnest stalks from the vegetable kingdom, carrying enamelled tiled roofs, pediments edged with lace, and cupolas in gold and silver network. Secondly, there are the paintings of mythological and historical subjects, in which philosophy, so familiar to the artists of antiquity, placed instructive scenes in the midst of capricious and light arabesques. These compositions, in which the actions of heroes, and the idea of the influence of the divinities, and of fatality pursuing the royal families, dominate, seem to have had for object the bringing the thoughts back to the implacable destiny of man,—showing him daily his existence shared with happiness and misfortune. The third class is composed of landscapes, sea pieces, and architectural views; sometimes apparently truthful representations, and sometimes fanciful compositions.

This classification is not adapted to the paintings on vases. In these, the subjects of the poems of Homer, the mythological fables of the rhapsodists transformed into popular legends, and scenes from the Greek tragedies and sometimes from the comedies, predominate. The human figure, idealized by the features of gods and heroes, occupies the principal place. But in these compositions, again, architectonic elements are very numerous and of the highest interest. Towns, temples, theatres, fountains, royal palaces, and private edifices, and a considerable number of funereal monuments, may be distinguished. In many of the paintings, where the entire scene could not be depicted, the artist has tried to express it partially. The indication of a doorway, the outline of openings of an unusual form, or of ordinary windows, the suspension of offerings and pictures *ex voto*, and of arms and trophies, serve to express the entrance of a temple or a palace, or the walls of a *pronaos* or a *prothyrum*: an altar, a vase or cup, indicate the place of sacrifices and ablutions: columns represent the *pteroia* which surround the *naos* of a divinity, or the peristyle which forms the atrium of a palace. Having remarked, as said above by ourselves, that the knowledge of these paintings would supply the place of documents that are wanting on the general history of the architecture of

the ancients, Mr. Hittorff proceeds to mention some of the examples which he has published; and he then proceeds to a new and extended study of one painting in particular. He first cites the reproduction, in the form of painting, of two funereal monuments of which the form is that of works of the kind still existing. In one of the cases, the subject of a painting mentioned by Pausanias as nearly effaced, is completed by the painting on the vase. The other painting also seems to represent a tomb with a figure-subject as decoration. In both these examples, drawn from the work of Passeri, "Picture Etruscorum," &c., columns with Ionic volutes are represented, as well as pediments; whilst the last-mentioned example displays a frieze with triglyphs conjoined with the Ionic.

The representations of columns on vases, the author observes, would afford occasion for some most important studies. The number and variety might form materials for a nearly complete course on the history of architecture. There may be found, he says, "the use, as conical support, of the tree denuded of its bark, thin in proportions, and bearing at the summit a piece of timber: this last oversails the thickness of the shaft only on two sides, in order to take the bearing of the architraves. These, then, are columns and capitals which explicitly characterize the primitive use of wood in the constructions of the Hellenes: they are consequently a powerful confirmation of the historic ideas which establish this fact, admitted by men the most erudite." Continuing what we believe is a correct translation:—"A shaft much diminished; then above, a lusty *echinus*; the two joining together by the progressive jutting-out of a curved line with a broad and lofty square platform, the abacus: behold the first manner in which stone was used in the form of the Doric column. This shaft, again, presents the traces of a reminiscence of the form of the tree: but its crown-work is imprinted with the character, very pronounced, of a capital worked in a block, and no longer fashioned from a piece of wood. It is, in fact, the expression of the type of the column in stone, of the most ancient examples known." Representations of all the variations of the Doric shaft, of different dates, he says, are to be found. It will be seen that Mr. Hittorff does not notice any theory of the derivation of the Doric from Egypt, or the hypothesis of the production of the column of that order through the medium of successive chamferings of angles, starting from a square pier,—any more than the assertion of many writers as to the greater affinity of the form with original stone construction than with wood,—against which hypothesis and assertion, however, must be set the undoubted fact of the imitation of the stalks of plants in the most bulky of the Egyptian columns.

But not only the Doric, the Ionic order, Mr. Hittorff continues, is equally represented in all its phases. The study of the representations of columns with voluted capitals has even greater historic importance than the other: it shows that the origin of the Ionic, like that of the Doric order, mounts to the most distant period; and that the use of the former has followed the same gradation as that of the latter. At first, the proportions of the columns are like those of the primitive Doric; the shafts have no bases, the capitals are composed of big volutes and thick *abaci*, whilst subsequently the proportion of the shafts, the bases, and the capitals and their ornaments, are similar to those of the Erechtheion of Athens. In fine, a succession of columns of the same order, filling up the interval between the original rude solidity and the perfect measure of force and grace of the monuments raised at the best epochs of the art, unfolds a complete series of facts left hitherto hardly perceived. In comparing the voluted capitals discovered in Sicily and Greece with those on the vases, the accordance between the most ancient of the forms, like that of Selinus, confirms the fidelity of the representation. The accordance also furnishes, by the proof which it gives of the very great antiquity of the Ionic, a peremptory reason for its use with the entablature of triglyphs. This point, long unsuspected, Mr. Hittorff claims to have established, not only by the evidence of ancient paintings of all kinds, but by that of many buildings. It is equally worthy of remark, he continues, that the most ancient forms of the capitals are solid masses, where the abacus and the volutes, intimately bound together, extend themselves laterally in the direction of the architraves, and so as to relieve them; these capitals have the appearance of two consoles joined together, or a form more rational than was that of the Doric capital, of which the projection in front and rearward was without object, since it carried nothing and interrupted the fine horizontal line of the architrave. In taking into account the provision of solidity as "*point de départ*," it is the voluted capital as at its origin, and consequently the Ionic column, which would have been employed the earliest: the capital was

most *en rapport* with the entablature of triglyphs, "of which the original rational construction in carpentry has never been in the position to be contested in a plausible manner."

These observations, then, Mr. Hittorff urges, indicate a succession of circumstances entirely in favour of the appearance of the Ionic order in Greece concurrently with the Doric. One may conclude from them, he says, the impossibility of deriving the capital of the former from that of the latter order, and of placing its first employment at the temple of Ephesus, or its creation exclusively in Ionia: they open, in fine, a wider field for consideration on the pedigree of the nations that employed the Ionic, as also on the epochs when such nations raised the buildings bearing the predominant character of the architecture in which the order is found. Looking at the character and antiquity of the Sicilian Ionic capitals, and that still more ancient of the capitals on the vases, the author of the essay feels permitted to carry the date of the use of this kind of capital to that of the primitive edifices of Selinus. Now, that city was founded towards the thirty-seventh Olympiad, or eighty-four years before the commencement of the construction of the Temple of Diana at Ephesus, fixed as towards the fifty-eighth Olympiad. According to Pliny, the construction of the latter temple lasted 220 years, and the first Ionic capitals and the first bases were employed there. Taking this assertion, and supposing regular progression in the works, it would have required 110 years to arrive at the capitals, which therefore could not have been set in their places before the seventy-third Olympiad. But the allegation of that first use of the voluted capital seems so much the less certain, because Vitruvius, where he speaks of the same temple, makes no mention of the circumstance.

It is in explaining the origin of the three orders that the Latin author cites the Doric as the most ancient, and as invented fortuitously. It is in the same place that he attributes to the Ionians:—1, the discovery of the proportion of the Doric column of 1 to 6, which they had derived from the relation of the length of the foot with the height of a man; and, 2, the Ionic proportion, 1 to 8, as taken from the proportions more slender of the woman, the adoption of the base in imitation of sandals, the junction of volutes to the capitals to reproduce the curls of the hair, and the employment of the fluting of the shaft to figure the folds of the robe. It is in the same place that he explains the Corinthian column as representing the graceful form of a girl. It is not necessary, says the French author, to insist on the slight consistency of these several assertions. As regards the Doric, they are refuted by very ancient columns of that order which have only a height of little more than four diameters, and by those of the Parthenon, which have only five diameters and a half. As regards the Ionic, the forms of ancient capitals existing and those shown on vases, are against the hypotheses, whether of curls of hair, or rams' horns on altars, or others. It is the same as regards the flutings; since the Doric has them at all epochs, and has not only those with an arsis, but those with the fillet usually considered peculiar to the Ionic. Lastly, as to the base in imitation of the sandals; these were worn by men as well as women.

We do not find that Mr. Hittorff has quite explained the circumstance that some of his examples from the vases, which we understand him to give as of early date, are greatly attenuated in proportions; and we should be wrong in not adding, whatever importance our readers may attach to the remark, that the fluting of the pillars or pilasters, and some other details, have great resemblance to details of Roman works which are late in date.

The Corinthian and Composite columns painted on the vases, Mr. Hittorff adds, bear, like the Ionic, sometimes the entablature with triglyphs.

Relative to the character of architecture that was the result of this mixture, as we should call it, of the orders, he has some remarks which may be interesting to those who have read our article of a recent date on Mr. E. Renan's researches. These researches, it will be remembered, had some bearing on the question of architecture, if art there was, amongst the Jews. Mr. Hittorff says, if it appear fair to draw the rigorous consequence from the antiquity of the Ionic order, and its primitive use without base, and with an entablature of triglyphs,—as the order is seen in the tombs hewn in the rock near Jerusalem,—namely, that these tombs mount to the epoch of the kings of Judah and of the prophets of whom they bear the names,—it is impossible not to see in them the traditional imitation of monuments of epochs very distant; a supposition that is confirmed by the elements of Egyptian architecture that those tombs also display.

In one of the plates of Mr. Hittorff's work on polychromatic archi-

ture already named, representations were given of Greek and Roman monuments, in which there were entablatures with triglyphs surmounting Corinthian and Composite columns. The fact of such a conjunction practised, is confirmed by what may be found in the first chapter of the fourth book of Vitruvius. The old author, as we translate from the French, says: "The Corinthian column is different to that of the Ionic only in the capital, which is in height the diameter of its shaft: whilst the Ionic capital has in height but a third of this diameter. The entablature for the Corinthian order is borrowed alternatively from the Doric or the Ionic. The Corinthian order has by itself nothing pertaining to it in its entablature and the ornaments of this latter; but sometimes, according to what is proper for triglyphs, mutules are placed in the coronæ, and guttæ in the architrave, as in the Doric order; sometimes, according to the Ionian variety, it has the frieze ornamented with sculpture and dentils distributed in the cornice. So that, by the side of the Doric and Corinthian orders, the introduction of a capital has created in architecture a third order." In reference to this, Mr. Hittorff had said, in his book, that many Corinthian entablatures, belonging to the antique, that Philibert de l'Orme had drawn at Rome and which he published in his work, bear in like manner triglyphs.

All the varied representations of columns are recognised as copies of real architectonic elements, made with rapidity by painters with whom might be expected to be wanting the rigid exactitude that architects alone might have been capable of bringing to the work. That would probably be our author's explanation of a difficulty which we have alluded to. Finally, the *stèles* on the vases crowned with palmettes, and identical with the *stèles* of marble, should be examined, as well as the Doric and Ionic columns of a particular proportion, and an expressive character as isolated funeral monuments; also the very simple folding-doors to openings, with their accessories, rails, stiles, knockers, locks, and ornamental nails, as they are sculptured on tombs, or on stone and marble relieves; and other folding-doors which bring to mind the descriptions of the magnificent gates of bronze enriched with sculptures in gold and silver, or of precious woods encrusted with ivory, mother of pearl, and ebony, which decorated the splendid sanctuaries;—let these be observed, he says, as well as the ornaments of architecture, and always will be found reproduced the *motifs* that we admire now, as painted upon the ancient temples of Sicily, or sculptured on the fine monuments of Greece.

THE MONUMENTAL CHARACTER OF FRENCH ART.

THERE is a monumental character about the best pictures of the French school that distinguishes them in a more marked manner from English pictures of the same class than any other general characteristic that can be pointed out. Some critics have called attention to the more sober, and perhaps too brown, tone of French painting as its chief distinction, and remark on the great want of colour which is felt on passing from the English gallery to the French at the International Exhibition. But this is a minor, and altogether superficial distinction. There is in the French school a tendency to idealization, and in the English a preference for literalness, and what has been termed realism, which lie much nearer the root of the real distinction. There is, also, a conscientious carefulness in the treatment of detail in French paintings of a high class which is frequently absent in English works, in which the painter is too apt to supply by a clever dash those effects of drapery, or any other accessory, which the French artist would carefully paint-in, according to his own conception of the style in which its reproduction should be treated. It may be said that our pre-Raphaelites have exceeded every other school in the careful treatment of every detail. This may be so; but neither the manner nor sentiment of the pre-Raphaelites have any analogy with the kind of care which characterizes the French treatment of accessorial objects. The leading quality of the French school, as already stated, consists in a certain kind of idealization of the subject to be treated, both as to its general conception and the treatment of its principal figures. This kind of idealization extends also to the treatment of minute detail. The flutter of a piece of drapery, the tone or shadow of a wave, the amount of definition in a branch and its foliage, all these are idealized upon the same principle as the leading features of the composition. It is the instinctive and continuous observation of this principle that gives to French art a certain stately and monumental character which is the leading quality of the school. This quality is found even in the stiffest compositions of David; but it is of the more recent productions of French art that we

are speaking. The works of Girodet, Guerin, and other artists who flourished at the beginning of the century, form links between the style of David and that of the living (or recently living) artists of a school of which Ingres, Delaroche, and Horace Vernet may be cited as leading representatives.

The principle of idealization in the best examples of French art is always founded upon the chief characteristic of the object idealized, whether in a principal figure, or in a feature of subordinate detail. For instance, in the exquisite work by M. Ingres, at the International Exhibition, which he entitles "La Source," the poetical embodiment of a poetic idea is the main object of the artist. By "La Source" (the Spring, or Source) the painter wishes to symbolize the youth of nature—the morning of all life. The spring of water gushing from the rock is, in the mind of the painter, the youth of the fertilizing river, as the spring of the year embodies promise of summer flowers and the harvest of autumn. And so the girl-child, like the bud to the flower, is the youthful type of the mature and fruitful woman. In attempting thus to shadow forth pictorially the early springtime of the universal life of nature, the "Source" of her eternal fertility, he has naturally made the most beautiful of his symbols the principal one, the analogous emblems becoming mere accessories, but each wrought out with the greatest care according to its prominence in the composition; and each, with the principal figure, being poetically idealized. In this picture the essential characteristic in the author's conception was a poetical idea to be embodied in poetically idealized forms; the forms being strictly those of nature, but select nature, not common nature. The eye of a great artist becomes so trained to the appreciation of excellence that he is enabled to combine beauties which no one model could present, but which he has observed separately, and found the art of combining in a single form. His subject could have been treated in no other way. A realistic and literal portrait of a nude girl might have formed a clever picture, but not the poetically exquisite conception which the ideal of the great artist has here presented. It is this feeling and the conscientious care with which all the details are wrought (not with the painful literalness of the pre-Raphaelite school, but with just the requisite amount of definition, and no more) which impart to the great works of the French school, whether of large or small dimensions, that monumental character which almost invariably distinguishes them. Their careful refinement of line, their well-balanced parts, their correct drawing, impart to them a quality which makes them harmonize with the studied symmetry of architecture and sculpture much more intimately than the works of the English school would do, with but very few exceptions. This capability of amalgamation with the productions of the sister arts is one of the chief tests by means of which what we may term a monumental character in painting may be tested. "The Source," by M. Ingres, is a thing of beauty belonging to no especial time—there is no shade of expression—no national feature—no tone of colour that associates it more intimately with the sympathies of one age than another. Its charm, like that of Greek sculpture, is of all time. It is, indeed, like a sweetly tinted statue, pure as beauty wrought in "monumental alabaster," but warmed with the glow of a lifelike tone, which might serve as the model for that kind of statue-tinting which would be eminently successful, if it were but essayed with more boldness and more skill.

Of idealism of another kind, less poetical but more picturesque, the famous Hemicycle of the Ecole des Beaux Arts at Paris, is a fine example. In this composition, the great painters of all ages are represented in their habits as they lived, but so harmoniously grouped, so grandly and yet so carefully drawn, that the ascetic features and simple robe of Cimabue seem quite in their place near the elaborate richness of the dress of Raphael and his courtierlike scholars, and within sight of the gorgeous Flemish dress of the dramatic Rubens. In the separate figures, it is, as the subject demands, a striking individuality rather than a generalizing and poetic idealism that is sought by the painter. And yet, though the individuality is in each case striking, it is so rather through an ennobling treatment of the leading quality of each subject than by a literal (and as one may say, photographic) treatment that the effect sought for is so finely achieved. A pre-Raphaelite would have given us such painfully accurate reproductions of the wrinkles of Rembrandt, the pimples of jovial Adrien Braüwer, and the broken nose of the great Buonarroti, that, without adding one iota to the striking individualism which has been cast about each figure by the pencil of Delaroche, would have marred with vulgar detail one of the noblest works which art has ever created. It would have been like that characteristic of Chinese painting, which would elaborate more carefully

the darning of a rent, than the natural folds of the drapery itself. In short, either an overwrought minuteness or a dashy carelessness of detail would utterly destroy the monumental character which distinguishes the picturesque as much as it does the poetic school of French art.

In paintings of a dramatic character the same monumental grandeur of treatment still prevails. Among pictures of incident which belong to this class we may select battle-pieces as those in which the French, as a naturally military nation, are most eminently successful. The battle scenes of Horace Vernet, Bellangé, Isidore Pils, Adolphe Yvon, and many others, exhibit a mastery over subjects of action that was never attained before, in any artistic epoch. The terrible truth of mortal combat is told with a power evidently derived from actual knowledge. Vernet and Bellangé have been deep in the *mêlée* of the scenes they depict with such force, and such a thorough knowledge of the atmospheric effects produced by that terrible burning of gunpowder. They have heard the rattling volley from a serried line of infantry, have seen the Line disappear in the smoke-cloud of the discharge, and seen that cloud borne off by the wind, as the Line emerged from it, *au pas de charge*. The effect of masses, the detail of nearer groups, the expression of foreground figures, have all been seen and studied from the life,—and from the death. And yet, while all is so terribly true in its general aspect, and even in its details, it is ennobled by a certain kind of idealism which seems to impart additional truth, rather than exaggeration or any kind of falseness to the subject. This is necessarily the case when the idealization is guided by a principle which derives it from the leading characteristic of the special nature that is to be depicted: it is not intensification—not over action, not a positive increase of any ingredient in the general effect that is sought, but a kind of general ennobling of existing features. The imperturbable coolness, combined with the power of frantic dash, which distinguish the Zouave, is mentally studied; and various individual types, through the medium of which it may be best expressed, are developed with the true artistic power with which nothing but atelier life under the early guidance of great masters can ever fully endow an artist. It is this system of organized study in youth, the emulation of a crowd of pupils, half rivals half friends, which gives to the works of the greatest among French artists an art-completeness which stands in some respects unapproachable. These qualities of French art are like the kind of wit which is translatable into all languages. The "Spring," or the "Odalisque" of Ingres would be equally perfect, equally beautiful, as statues in marble; and the most complicated battle pieces of Vernet or Bellangé could be reproduced as marble reliefs with scarcely any other loss than the colour and the atmospheric perspective; so skilfully are the groups at different distances managed, with that general knowledge of all art which seems to include in its grasp the possibility of marble and chisel being adopted as mediums of expression instead of brush and canvas. It is this broad feeling for art in its widest sense that gives to works of the great French artists that monumental character which we have sought to define in the present essay, in which no disparagement to native talent is in any way inferred in the views expressed. Indeed, the English school has great, and in some respects unapproachable excellences of its own, which we propose to analyse on some future occasion.—*Literary Budget*.

CEMENT FOR LEAKY HOUSE ROOFS.—The *Scientific American* gives the following receipt for making cement for leaky house roofs:—Take four pounds of rosin, one pint of linseed oil, two ounces of red lead, and stir in pulverised sand until the proper consistency is secured, and apply it warm. This cement becomes hard and yet possesses considerable elasticity, and it is durable and waterproof.

A FOUNTAIN is in course of erection before the eastern entrance of the Champs Elysées, which is nineteen feet in height, and is composed of a lower basin, eleven feet in diameter, another smaller basin, and a pillar for the jet of water, out of which springs a candelabrum. It is formed of granite. The principal basin was wrought, by manual labour, out of a block of granite weighing about twenty-four tons and a half, and which was transported from Cape Finisterre.

A GALLO-ROMAN tombstone has been discovered, in digging the foundation of a new court of justice at Auxerre, in the site of the old Botanic Garden. An earthen urn, containing charcoal, was found near the tombstone.

THE explorations at the Palatine Mount, in Rome, are being continued with success. A statue of great beauty and of high value has just been found, which is said to be of the finest period of Greek art.

REVIEWS.

ENGINEERING AND ARCHITECTURAL PROGRESS.*

THE rapid strides made by engineering and architecture during the present century have imperatively called for this publication. So numerous and diversified are the improvements to which our attention is daily directed, that some *résumé* or digest of the successive steps becomes a desideratum, not merely to the professional architect and engineer, but even to the general reader. The most abstruse *penetrabilia* of science exercise an important influence over our every-day domestic life; and the destinies of the world hang trembling in the balance, whilst its chief families are straining every nerve in the struggle for naval supremacy. To supply the world with a faithful record of its engineering progress without touching on the personal opinions which to a greater or less extent must enter into all controverted questions, has been the object of the author of this work; and to say that he has performed his arduous task with zeal and impartiality is but faint praise for the ability with which it has been executed. It is indeed a comprehensive digest of all matters of interest that have occurred within the year. The first division of the work is devoted to Civil Engineering, and comprises a series of papers on Railways and Roads; then come Harbours, Docks, and Canals, Gas and Water Supply and Sewerage, Agricultural Engineering, Mechanical Engineering, Mining, Metallurgy, and Telegraphic Engineering. Division II. is devoted to Architecture; the first section discussing Style and Design, and the second Practical Architecture. Division III. is occupied with Military Engineering; the first section being devoted to Constructions, Fortifications, &c.; the second to Weapons and Projectiles; and the third to Transport Service and Pontoons. Division IV. is on Naval Engineering: section first, Hydrography, Tides, and Currents; section second, Shipbuilding, Armaments, &c.; section three, Steam Engines, Propellers, &c.; whilst Division V. is occupied with miscellaneous questions, such as important legal decisions, and notices of recent works on engineering and architecture. The volume contains on the whole above sixty well-written papers, many of which are treatises of no ordinary merit; so that the work may be pronounced to be a compendium of what every practical or well-informed man needs either to remember or have at hand to refer to.

In the department of Civil Engineering much attention has been directed to the extension of our metropolitan railways, and the consequent demolition of old and creation of new streets. At present the great centralization of our street traffic is directed towards Lothbury on the one hand, and Westminster on the other, thus throwing on the leading thoroughfares of the metropolis an amount of traffic so enormous as to become unmanageable by the ordinary means of horses and carriages. In order to remedy as far as possible this evil two distinct measures have been initiated—the one having as its aim the superseding the necessity of sending goods or minerals from one terminal station to another, while the object of the other has been to divert the passenger traffic to the City from the already over-thronging thoroughfares. Six lines of railway embrace the former remedial measure; while of the four branches of the latter class, the Metropolitan or Underground Railway is that which has attracted the principal attention of the public. Whatever may be the result with reference to the bulk of the heavy goods traffic of London, one thing is certain, that the lines of interception have assumed great importance as passenger or “omnibus” lines, and thus increase the concentration of the passenger traffic to and from the principal termini. Two stations (the Charing-cross and Victoria), however, will enable the traveller to gain his line of railway without encountering the delays of traversing the crowded heart of the City. The metropolitan lines of railway will, however, tend rather to the increase of traffic than to the removal of the City and London Bridge obstructions. As a considerable portion of this overcrowding arises from the necessity of transporting merchandise from the Docks to Bermondsey and Southwark, the only efficient remedy would be to establish a communication at some point *below* the present bridge, either by rendering the Thames Tunnel available for carriage traffic, or by the erection of a new bridge from Tower Hill to Horselydown. Although to a certain extent the proposed erection would influence the value of the wharf property lying between it and London Bridge; yet by means of a swing bridge in the centre and lateral

opening, a clear passage would be afforded at high tides. A great error has been assumed by the majority of the improvers—namely, that the obstruction occurs on the bridge itself. Now this is not so; the stoppages originate at those parts where the respective abutting roads pour into the chief artery. Instead, therefore, of widening London Bridge, or opening that present dead lock, Southwark, the only solution of the Gordian knot is to be found in the construction of the suggested new bridge from the eastern side of Tower Hill.

These changes, however, have not been brought about without involving the destruction of a large amount of property, and the consequent removal of districts hitherto specially devoted to the residences of the poor. All sudden and violent changes necessarily involve temporary inconvenience. Still, however, there can be little doubt that the poor will eventually be the gainers by their removal, and the consequent sanitary improvements in their condition.

A fierce battle has been fought in connexion with the introduction of Mr. Train's American tramways into London. Without desiring to reopen this *questio verata*; there can be no doubt that the proposed line of rails would constitute a serious hindrance to the carriage traffic of London. It is a matter, perhaps, of regret that these tramways should have been laid down in the suburban instead of the more central districts. As a means of lightening the present enormous traffic they are worse than useless, requiring special appliances and forms of roads. In the crowded heart of the City they are utterly valueless, but if established upon country roads of great width and little miscellaneous traffic, they are likely to become valuable adjuncts to the railway system, by extending its benefits to that part of the country which would not warrant the construction of a permanent way for locomotives.

The subject of our railways and roads induces Mr. Burnell to make some pithy observations on the oft recurrence of terrible catastrophes in the shape of railway accidents which, from their number and fatality, demand a more than cursory review. During the severe winter of 1860 and 1861, many accidents occurred on the English railways arising from the great changes produced in the molecular structure of the iron used in the working parts of the engines and carriages. A careful examination of the year's accidents establishes the fact that the casualties of the winter season are connected with the action of natural laws; whilst those of the summer season may be attributed to defective traffic arrangements. The same investigation, however, points out that, in the majority of instances, the accidents in the former case were, humanly speaking, nearly as much under control as in the latter. Two other important principles may be deduced from the black catalogue of 1861. Firstly, that the great source of danger to railway trains during the prevalence of frosty weather consists in maintaining the same rate of travelling for express trains as during summer. Secondly, that the entire mode of railway organization and administration must be radically changed, and that the *personal responsibility* must be concentrated in the traffic manager. It is for the want of this personal responsibility that so many fatal accidents have occurred. No amount of neglect or carelessness on the part of subordinate officials can divert our attention from the defective organization of a large administration working under many heads and possessing a divided responsibility. The following instance shows that the French railway system “ensures to the travellers it serves a security which is about double that which is afforded by our own. On their great lines there is a managing director who exercises, under the control of the board of directors, supreme power over the working details of the line, and is directly and personally responsible for any neglect, or for any carelessness or preventable accident upon the line entrusted to his care. Some years since, an accident did occur upon the then Paris and Rouen line, when the managing director was present, and several travellers were wounded. The railway company settled the claims of the travellers for compensation, so as to prevent their appearing in court, in civil actions; but then the state prosecutor interfered, and insisted upon the exercise of his right to protect the persons of the citizens using the railway. The consequence was that the managing director, the station-master, superintendent, porters, engine drivers, stokers, guards, pointsmen, and all who were directly or indirectly concerned in the accident, were fined and imprisoned, and although the company paid the fines, the penalty of imprisonment was perforce paid in person. The lesson, however, produced its effect, for the managing director remained in office for about twelve or fourteen years after his release, and no other accident from defective service regulations occurred during his tenure of office.” This fact alone will speak for itself, and demonstrate the necessity of the sole and undivided responsibility being centred in one man, and in rendering him both pecuniarily and personally liable for any neglect of

* *The Annual Retrospect of Engineering and Architecture: a Record of Progress in the Sciences of Civil, Military, and Naval Construction, from January to December, 1861.* By G. R. Burnell, C.E., F.G.S., F.S.A. Lockwood and Co.

duty by his subordinates over whose selection he presides, and who act exclusively under his orders.

The recent outbreak in our Indian domains has effected a complete revolution in the whole state of Indian society. Having hitherto extracted the maximum of wealth from the conquered races, our rulers have at length tardily recognised the principle that the dominant race is bound by the most solemn obligation to use its power for the purpose of advancing the moral and intellectual welfare of the subjugated race. We have in fact discovered that we are bound, after having drained India of her resources, to afford her the opportunity of reproducing in a more enduring form that wealth of which we have for so long a period been the mere recipients. The Government of India has now taken active steps to encourage the formation of public associations of capitalists for the purpose of executing those works of improvement formerly considered to lie within the exclusive province of the State. We have consequently seen during the past year an extraordinary development of enterprise for the construction and establishment of railways, irrigation canals, and harbour works—undertakings with which the future prosperity of the colony and the present advantage of the mother country are alike intimately connected. Calcutta, Bombay, Madras, Delhi, are in course of being connected by a series of trunk lines between the capitals of the various provinces, from which branches to the most important of the local capitals are eventually to be executed. More than four thousand miles of railways have been sanctioned, and of these nearly one-fourth is already opened for traffic.

The ungrammatical result of the labours of the Royal Commission for the purpose of considering the plans for embanking the Thames within the metropolis has been given to the world. No subject more forcibly illustrates the evils of procrastination than this. When, many years ago, Colonel Trench and the eminent artist, John Martin, brought the subject before the attention of the world, the solution of the difficulty would have been comparatively easy. Mr. Burnell justly observes that "delays almost always tend to increase of cost. They are like the Sibylline books, which must be purchased when offered, or perhaps lost for ever," and every delay increases the importance of the respective conflicting interests. After all, there is nothing very original in the recommendations of the Commission. The coal-tax and wine dues are to be continued, and will no doubt be fully absorbed by the expense of the northern embankment and the adjacent streets. Some idea of the expense may be formed from the fact that the compensation for wharf property alone will amount to nearly a million sterling. The southern embankment and other attendant contingencies appear to be for the moment lost sight of, the general opinion appearing to be that "sufficient unto the day is the evil thereof." One thing, at least, is certain, that the expense will be double the present estimate.

In the early part of 1861, the attention of chemists was directed to the evolution of sulphuretted hydrogen gas, which, in spite of the tidal movement of its waters, has of late years been so apparent in the Thames. For years these noxious exhalations have been deleterious to the crews and labourers residing on board the vessels in the docks, but it was not until the destruction of the sheathing of the vessels themselves that inquiry was made into the causes of it. There can be little doubt that the comparative tranquillity of the water contained in the basins is so far favourable to the action of the sulphuretted hydrogen upon the metallic sheathing, but it is utterly erroneous to suppose that this action is in operation only in the river Thames. The period during which a ship is in dock forms comparatively a small portion of the time during which the vessel is exposed to the action of water. It is a well-known fact, that sea water, in certain parts of the ocean, has a most deleterious influence upon the sheathing of ships, while the incessant competition now prevailing has a deterioratory influence upon the quality of the metal supplied by the contractor. Should, however, the development of iron-shipbuilding continue in the same direction in which it has hitherto tended, it is not improbable that the question of securing the copper bottoming of wooden vessels will become a matter of secondary importance; it, however, attains to a higher degree of consideration when we reflect, that in order to form an accurate judgment on this subject, the experiments ought to be for all scientific purposes extended to every material employed in the construction of docks and harbours. The scientific statistics are worse than valueless, unless a practical result be arrived at, as not only the Thames, but every dockyard and seaport town in the kingdom is vitally interested in the result of this investigation.

When the English engineer was derisively asked, for what purpose he considered rivers to have been designed, he is reported to have replied, "To feed canals." In the present day, however, the extension

of railway intercommunication has entirely lost to view the numerous advantages attendant upon the development of river navigation. It is, therefore, worthy of notice, that the French Government is directing its attention to the extension of the navigation of the tidal portion of the Seine. This is being brought about by embanking the low lands between Caudebec and the embouchure of the river near Quillebeuf. The *modus operandi* is, by forming submersible dykes parallel to the intended axis of the stream, of such a width as to allow the flood tide to create by its own action a channel, in which the water can flow with a uniform velocity sufficient to carry forward the alluvion. Thus, between Rouen and the sea a permanent depth of thirteen feet has been secured, and a regular service between London and Paris has been created by means of steamers drawing six feet of water. May not the French Government be more mindful of the benefits of competition than we are? Mr. Burnell appositely remarks, "*Eus est ab hoste*," why not "*ab amicis*?"

In Holland and France attention has been lately directed to the operations of the various boring molluscs. "It is now universally admitted, that the *teredo navalis* casts its spray about the end of June, and that the young worms attach themselves to such pieces of wood as offer them some protection during the early stages of their growth. Wood covered with barnacles, or pieces of timber framing with numerous joints, such as are formed by the halving of wales, cross-braces, cills, &c., are particularly exposed to the attacks of these creatures, who enter the wood as soon as their boring apparatus is sufficiently developed to allow them to traverse horizontally any layers of the wood that may be distasteful to them. When they have once established themselves in the body of a piece of timber, they bore species of vertical tubes in the direction of the fibres of the wood, whose dimensions increase in diameter as the worm increases in age; but the tubes are observed never to descend much below the low water mark, or to ascend above high water. (In this, it may be observed, following the general law governing the extent of the operations of the coral insect.) The zone of the greatest activity of the *teredo* is, however, about mid-tide level. The tubes of the *teredo* sometimes are nearly half an inch in diameter, and the wood they attack is soon completely riddled to such an extent as to break under the action of the waves. The animals line their tubes with a casing of carbonate of lime, and it is no doubt on account of the facility afforded by the shores, which contain that ingredient, for the secretion of their shelly envelope, that their numbers are usually the greatest on the shores composed of the alluvial matters brought from the limestone formation. The *limnoria terebrans*, the small worm which equally with the *teredo* attacks wood in sea water, seems, on the other hand, to affect the shores whose alluvial matters result from the disintegration of silicious rocks. The *limnoria* never attains the dimensions of the *teredo*, and, indeed, it hardly ever is found of more than $\frac{3}{8}$ rd of an inch in diameter; from this circumstance it is enabled to enter fissures of the wood which would not admit the young *teredo*, and it is far more difficult to guard against than is the latter."

The remedial measures hitherto adopted against the ravages of this class of what we may call pholadian animals have consisted either in sheeting the substance to be protected with copper, or zinc, or else by covering the whole surface of the wood with copper nails. In both the cases, however, the great difficulty appears to be to *effectually* cover the entire exposed surface. This has led to the institution of a series of experiments with creosote, and it appears to be established, beyond the possibility of doubt, that by the injection and thorough impregnation of timber with creosote, not only is the timber preserved from the attacks of the *teredo navalis*, but likewise secured from that decay which taxes the best engineering skill to avoid. The success, however, of the operation entirely depends on the use of good materials and on the withdrawal of the sap from the wood prior to the injection of the creosote.

It is impossible to close the engineering department of the work before us without being irresistibly struck by the activity exhibited by our Continental neighbours. This is more especially to be noticed in France, where the Government readily affords every assistance in its power for the discussion and development of scientific truth. In more than one branch our civil engineers have been startled into activity by the silent yet rapid advances of their French brethren.

Now that the unfortunate personalities which were needlessly interpolated into the "battle of the styles" have passed away, and the *questio vexata* has been temporarily decided, we may with some justice inquire how far the interests of art have been furthered by this contest between mediæval and classic architecture. The first impression

clearly is, that the terms used have been applied in a contracted sense, an absurd shibboleth, by which the predominant party for the time being sought to overwhelm and annihilate their antagonists.

We cannot too often urge that this anxiety to reproduce the outward and visible forms of antiquity is a great mistake. As has been justly observed, "Classicists and Mediævalists who dwell exclusively upon archaeological correctness alike err in this respect, that they seek to carry society backwards instead of forwards; at the same time their system is founded upon a moral untruth, for all true art must be a reflex of the age in which it is produced; the literal reproduction of the past is at the best merely a mechanical adoption of the ideas and feelings of others who lived under very different conditions to ourselves. The intermixture of the question of religious faith with the fundamental principles of architecture must not be a subject of surprise to the thoughtful reader. It is in the present day no longer a question as to whether the artists of the present day are personally indifferent to the faith they typify, or express the feelings of those whom they represent. In so far as all truly devotional religious feeling exhibits itself in the ordinary acts of common life, so will the buildings of an age show forth the outward signs of a prevalent faith, and the tendencies and desires of contemporary society." The following remarks upon the mediævalism advocates are worthy of attention:

"Great as were the men of those times—true, harmonious, and ideal as were the arts then practised—they would but constitute an anachronism if erected in our days; and even when the modern classical style is recommended for adoption, it must be understood that it also must be accommodated to our usages and modes of thought. Architects, it is repeated, must learn to be of their own times, and, in spite of the eloquent denunciation of a mediævalist writer, they must learn to exercise a discreet eclecticism based upon the *study* not upon the reproduction of the past. The quarrels of Classics and Romantics (which, under other names, are identical with those of the classical and mediæval schools of architecture) will never cease, because they spring from deep-seated and irradicable passion of the human soul—that is to say, from the respect for authority and tradition on the one hand, and the love of independence on the other. But these distinctive principles of action may be indulged without the sacrifice of originality of thought and feeling, and our efforts must be turned in a prospective rather than in a retrospective direction if we desire that our age should leave its impress upon the history of architectural development. The copyism of Flemish town-halls and of Italian broletti to-day will be found equally sterile with the copyism of Greek temples in vogue twenty years since. Both styles of art were beautiful in themselves, and were consistent with the age and the circumstances under which they arose. The moderns must do as the ancients did; learn, firstly, to think freely; then, if they study the technical processes of their predecessors, they will in all probability eliminate a vital style of their own."

Among the leading topics of architectural *on dits* we may fairly classify the preservation of our costly Palace at Westminster. It at first strikes the observer as slightly ludicrous that the New Houses of Parliament should require preservation prior to completion; that the commencements of decay should exhibit their track prior to the final departure of the workmen. What a satire upon the "living rock" of the ancients, the *vivo sedilla saxo*. True it is, however; and we have now to inaugurate a new era in architectural history—viz., that of the preservation of stone. Without disparaging the many inventions that the exigencies of the occasion have called forth, we do not think that we shall err in calling public attention to the preparations of Mr. Ransome and the silicate zopissa of Mr. Szerelney. The following summary will put our readers quite *au fait* to the respective merits of the two processes.

"Mr. Szerelney's process is avowedly a secret; and by some inconceivable influence the Government has allowed the application of this secret process to a very large portion of the building. Of course it is absurd to suppose at the present day secrecy can long be maintained in such cases as these, and the author has taken pains to discover, at least approximatively, the composition of the silicated zopissa about which so much noise has been made. The ingredients employed consist almost entirely of the silicate of soda, mechanical silica, oxide of zinc ground in linseed oil, having oil of tar and some size or glue, and the peculiar smell said to have been perceived during the application of the process may be thus accounted for. Now the only advantage the above mixture, whether the ingredients be applied separately or together, could possibly have over Kuhlman's process would consist in this—viz., that a species of protecting coat might be left upon the

surface of the stone which should allow the silicate of soda to form the combination with the magnesia and the lime required to ensure its permanence. Practically this combination does not seem, however, to take place, and certainly the protecting coat is in many instances thrown off, whilst in many other cases where it remains it sadly disfigures the artistic character of the stone. After a careful inspection of the Houses of Parliament, the Commission, in fact, arrived at the conclusion that the application of Mr. Szerelney's process had not proved of greater service than any of the other methods of preserving stone.

"Mr. Ransome's process for the preservation of stone consists, according to his specification, in applying, firstly, a solution of the silicate of soda to the stone, which should be carefully cleansed and in a dry state, so as to ensure the penetration of the solution to as great a depth as possible. When the stone has been saturated with the silicate of soda, a second solution of the chloride of lime is made to follow it, and a double decomposition takes place between the two solutions, by which the silicate of lime is thrown down in the stone, and the chloride of sodium is left free to effloresce upon the surface.

"Practically, however, this plan is found not to succeed, the protecting coating not being able to arrest the destructive chemical action going on in the interior of the stone by capillary attraction."

The question of iron *versus* wood for ship-building is still in process of determination. The subject is so fully before the public, that any comment would be not only superfluous, but invidious. Notwithstanding the partiality exhibited by the War Office, truth will undoubtedly prevail in this as in other cases. The only regret is that our circumlocution offices make that article so prodigiously expensive.

Such are some of the varied contents of the handsomely printed and well got-up volume before us. It is the best book of its kind that we have ever seen, and we are agreeably surprised to find frequent flashes of wit and humour breaking through the hard scientific crust with which the body of the work is necessarily overlaid.

NEEDLEWORK, USEFUL AND ORNAMENTAL.*

PAINT and paper have so far superseded the use of tapestry in the adornment of public and private buildings, that we are thankful to Madame Caplin for lifting the veil that has fallen over the past, and affording us a glimpse of the olden times, with their gorgeous hangings and other rich and rare productions of the needle.

In the lecture before us we have a popular history of "The Needle and Needlework" in all ages, commencing with the earliest times, and descending through the stream of history; we have clear and often amusing descriptions of the vestments of heathen gods, the robes of kings and princes, the altar-cloths of Christian churches, the vestments of priests, and the various fashions, ornamental and absurd, in which humanity has clothed itself since Adam and Eve made their first experiments in sewing. Madame Caplin is already known to the world as the author of several works on the health, beauty, and costume of her sex, which have been widely read and highly appreciated. A profound study of the female frame has rendered her familiar with its requirements, and hence, what she says has the stamp and freshness of original thought and practical utility. She has the rare ability of clothing masculine thought in the chaste softness of feminine grace; and her lecture on the needle is a combination of tact and learning alike worthy of the writer and her subject.

GENERAL INTELLIGENCE.

SCULPTURE BY A PAINTER.—M. Wiertz, a Belgian painter well known in the art circles of the Continent, has just made an essay in the sister art of sculpture upon a scale that but few experienced sculptors would venture to engage in. He is now exhibiting at Brussels a series of models in plaster of the groups which he proposes to execute in marble, and his brother artists, both sculptors and painters, speak highly of the boldness and originality of the style he has adopted in working out his subjects, which are of a nature to test his powers to the utmost. The manipulation and general style of treatment are said to combine to a greater extent than was thought possible the capacities both of painting and sculpture. The three subjects selected

* *Woman and her Work: the Needle, its History and Utility.* A Lecture. By Madame Roxey Ann Caplin.

by the artist form a kind of continuous history. The first he calls the "Birth of the Passions;" the second, "The Struggle"—that is to say, the struggle of man with general nature; the third he calls "Light," by which he means to express the eventual development of intellect, and the origin of civilization. In the first, the contrast of the forms of female beauty with the harsher, but nobler, because more powerful development of the male figure, is said to be remarkably and exquisitely carried out. In the second subject, the muscular power of man in its highest development forms a Titanic sculptural group, which is said to be very noble and striking. In the last composition, the efforts of man are represented as devoted to higher conquests than those which result from mere bodily strength and manual readiness. He is occupied with those achievements which are conquests of the brain rather than the hand; and it is in this last group that M. Wiertz appears to have put forth all his efforts. The power exerted by this artist over his newly adopted material is said to be very extraordinary; effects of distance and perspective being as successfully expressed in these compositions as in painting. There is among the sculptural decorations of St. Peter's at Rome a colossal marble picture representing the Conversion of Constantine, which is treated in a manner resembling that of these marble pictures of M. Wiertz. In the piece of Roman sculpture to which we allude, the principal figures, in the front, are entirely detached from the ground, while those intended to be slightly less prominent are in high relief; other more distant groups, and a landscape, are in lower and lower reliefs, as they recede and form the background.

THE new Guard Room in Windsor Castle is now completed; the architecture is in strict accordance with the early English style of the ancient towers. Above the officers' rooms is a large apartment intended for a museum, in which will be placed any objects of antiquity connected with the Castle that may be from time to time discovered. A small collection already exists, which will form a nucleus.

It is to be regretted that the eminent painters and sculptors who have appended their names to a remonstrance against the colour of the draperies in the Picture and Sculpture Galleries of the International Exhibition did not make their complaint sooner. It would really be a useless waste of time and means to make the required alteration at this late period of the season, when the Exhibition can scarcely count upon more than one little month of further existence.

At Dives, in Normandy, the celebration of a somewhat remarkable anniversary has just taken place; that of the completion of the column erected to mark the spot from which the expedition of William the Conqueror was seen to set sail for the subjugation of England. The column occupies the highest point of some cliff-land which separates Dives from the Valley of Beuzeval. Many English and French archaeologists were present on the occasion, and a tablet was uncovered in the ancient church of Dives on which the names of all the chief companions of the Conqueror have been engraved.

AN institution of arts and trades (*arts et metiers*) for women is being established in Paris; not with the view of inducing women to enter into general rivalry with the other sex, but only to enable destitute widows or orphan girls to learn some branch of art or artistic industry by means of which they may obtain an independent existence. The institution undertakes to ascertain the nature of the art for which each subject has the greatest aptitude, and to afford the necessary course of instruction; and lastly, to launch each individual in her honest career, affording such occasional assistance as may be required till an independent position has been secured. The project meets with very powerful support; and the intentions of the institution are soon likely to be in full activity.

THE works of the New Louvre are progressing rapidly. The projects for lighting and decorating the fine gallery intended for the reception of masterpieces of French art, from Jivonne Dubois and Jean Cousin to Descamps, have been maturely considered, and are being carried into execution. This gallery, which is on the principal story, extends from the Pavillon Daru, and passes through the Pavillon Denon, to the Pavillon Mollien. It is 450 feet long by 30 wide, and the lighting is from the ceiling. The decorations of the great square salon of the Pavillon Denon, which will form the centre of the gallery, are of a very magnificent character. The most eminent ornamentists of the day are employed upon these important works.

A PICTORIAL drama of Geology has been recently enacted at the theatre of the Circus, at Bruxelles, which M. Rohde presented to his audience in a series of forty-five tableaux, which he termed the life of the terrestrial globe. In the first stage a vast nebula was seen floating

in space, for M. Rohde adopts the Nebular theory. It gradually acquired consistence by rotary impulsion and chemical affinities till the formation of a thin pellicle took place, which was the first step towards the formation of the now solid crust of the earth. The tableaux in which these changes were exhibited are said to be most ingeniously contrived, and to produce a wonderful and impressive effect of magnitude. Next came successive layers of the earthy crust in the form of incandescent gneiss, porphyry, and then granites. Then the sedimentary deposits—tableaux of the vast volcanic upheavings that disturbed the regularity of the stratification. The grand pictures of the earliest forms of vegetation, in which gigantic forms of foliage were exhibited of strange and unusual character, are said to have produced a striking effect upon M. Rohde's audience; an effect, however, which was much surpassed by the succeeding tableaux, in which the first monstrous shapes of animal life were exhibited—followed by other tableaux, exhibiting the destruction of monstrous races of reptile life by vast convulsions, and the usurpation of their places by other forms, gradually softening towards beauty and symmetry, till the earth is supposed to have become fit for the abode of man. The exhibition, or performance, was received with unanimous applause by a greater number of persons than were ever previously assembled in the theatre, and who appeared to watch the geological spectacle with the deepest interest. The display was repeated on Thursday last with equal success.

OUR FRESCO-PAINTINGS IN THE NEW HOUSES OF PARLIAMENT.—The rapid decay of many of the frescoes in the Houses of Parliament is causing much discussion in artistic circles both at home and on the Continent. To encounter such unsatisfactory results is indeed very discouraging in our first attempts to restore a lost art. It is whispered that in several cases corrections were made without preparing the plaster afresh, milk being used as a *siz*, to cause the new work to adhere. It is manifestly impossible that colour so applied could incorporate itself with the plaster, in the way that it should do in true fresco, and equally certain that very rapid peeling would take place. Decay was certain. It was only a question of time. The artistic portion of our foreign visitors, who now throng the apartments of our new Houses of Parliament three times a week, criticise very severely not only the already unsound state of comparatively new works, but complain also that the fresco-pictures occupy a far too subordinate position in the mural decoration of the edifice. Their position is said to be always either too near or too far from the eye; while their colouring is utterly crushed by the glare of the painted windows, with their heraldic blazonries of purple, scarlet, and orange. The over-profuse gilding, too, of the architectural decorations, heightened as it is by the free introduction of positive colour, assists in crushing the frescoes in the House of Lords, and leaving them in a very subordinate position. To these last criticisms it is answered, that the decorations of the House of Lords were devised expressly for gas-light effect, the sittings of the Peers taking place chiefly at night. It is said that when this vast apartment is brilliantly lighted with a direct light, and the painting of the windows made to occupy a subdued position, being only lighted up from without, that the effect is nearly all that could be desired. At a time when the decay of some of the frescoes in the Houses of Parliament is attracting so much attention, the discovery of an English fresco apparently executed in the reign of Elizabeth or James I., and still in good condition, is not without interest. The work is, moreover, one of some artistic merit, and should be seen by all artists interested in re-establishing this lost art. It was in pulling down a house in North-street, Sudbury, that the discovery of this fresco took place. In stripping off the paper at the end of one of the upper rooms, this picture, representing a lion hunt spiritedly composed, was first brought to light. The mounted hunters are in the costume of the epoch above named, and the whole is surrounded by an arabesque and floral border, after the manner of Continental frescoes and tapestries of the period.

THE SHAKSPEARIAN MUSEUM AT STRATFORD-ON-AVON.—Mr. Halliwell makes known to the supporters of the New Place scheme, that a museum will be established in the buildings about to be erected on the Shakspeare estate, in which he hopes to bring together an interesting collection of memorials connected with the life and works of our great dramatist. The memorials will be of many kinds, such as earlier editions of his poems or dramas—deeds bearing his signature—objects manufactured from the celebrated mulberry-tree planted by the poet himself—in short, any Shakspeariana the character of which can be authenticated in a trustworthy manner. It seemed, when the project of purchasing New Place was first announced, that it was rather a mistake, for not a single wall remained of the comfortable residence

that the poet erected near his native Stratford, out of the honest gains of his energetic career as poet and dramatist in the great metropolis. Not one of the rooms remained in which he lived with the wife of his choice, Anne Hathaway, who is, no doubt, the mistress to whom he promises that immortality in his Sonnets which has been kept to the very letter. The name itself of Anne Hathaway, it is true, is not mentioned, but it may be inferred, and it will be cherished as that of the beloved of Shakspeare as long as the English language is spoken either in England, or America, or India, or Australia. But as no remains of their dwelling existed, it seemed as though a memorial hall might as well have been erected in London, at the Bankside, where Shakspeare not only acted as prompter on the performance of his *Hamlet*, but acted himself the part of the Ghost. Or, the Farm of the Hathaways—where the house that Shakspeare knew so well is still to some extent the same as it was in his day—might have been purchased in preference to New Place, as the same pathways lead to it over the Stratford fields along which the poet strolled with his Anne, immortalized by his pen, as he promised she should be. Yet, after all, if Mr. Halliwell succeed in forming a museum of Shakspearian relics on a site which was once Shakspeare's freehold, earned by the poetry that will live as long as our language, it is at all events something done in a cause which ought to interest every Englishman. Great care must, however, be taken not to allow of the admission of any doubtful relics. The initiated have had signal warnings in the case of the *soi-disant* lease granted to Burbidge, Shakspeare, and Co., of the Bankside Theatre, with the appended signatures, which were, dare we repeat it? impudent forgeries—and the “annotated” *Hamlet*, the falsity of which has been so signally demonstrated. Mr. Halliwell announces that the association for which he acts will purchase any Shakspeariana of authentic character, and that persons having such well-authenticated relics to dispose of, may address themselves to him at 6, St. Mary's Place, West Brompton. We hope that a worthy collection may be got together. Scanty as are the remains which bear any direct reference to Shakspeare, something of much interest may yet be done in the way of a Shakspearian museum; and we trust that, as regards the erection of the museum and other buildings and outbuildings, due regard will be had to artistic excellence and correctness of style.

THE EXCAVATIONS AT POMPEII.—A Berlin paper publishes the following extract from letters received by Professor Zahn from Naples and Pompeii:—“The organization of the Naples Museum is being much improved. The gallery of antique frescoes is newly arranged in mythological order, beginning with Jupiter. One half is already completed, and the other is about to be begun upon. In Pompeii the excavations are zealously carried on under a new Piedmontese contractor. The old accumulation of volcanic ashes, which had been thrown round the town in the direction of the sea, is now being removed, and sent by the little railway to the field outside the town beyond the amphitheatre. In the latest excavations, in a house in the immediate vicinity of the Casino of Signor dell' Aquila, a beautiful triclinium, with three richly decorated walls, and three fine pictures, was discovered. The first of these pictures represents the building of Troy by Neptune and Apollo; the second a drunken Hercules with numerous Cupids, who have disarmed him, and surrounded by several Fauns and Bacchantes; and in the third picture, Vulcan shows Thetis the arms of Apollo, among them a shield, on which are represented the Zodiac, Apollo, and the nine Muses. The second picture, with the drunken Hercules, is said to be, as regards both drawing and colouring, one of the finest ancient frescoes yet known. Next to this triclinium is another chamber, the ground of the walls of which is black, with embellishments in the Egyptian style and a number of small pictures. On the floor at the entrance of this house is the inscription, *Salve Lucro*. The next building is a tavern, with an inscription; and a painted elephant on the outer wall as a sign—the Elephant Inn. Opposite to this is a large place of amusement, with many paintings of a voluptuous character, and interesting inscriptions, and where there also have been found numerous objects in gold, silver, bronze, and glass.”

SAWING DOWN TREES.—A machine has been invented by Mr. L. S. Alder, of Cleona, Ind., for sawing down trees, which can easily be transported from place to place, and can be readily adjusted to suit different occasions. The invention consists in the arrangement of a longitudinally sliding frame provided with a steam-cylinder, a feed-motion, and the necessary pulley to give motion to the saw in combination with a truck running on wheels, in such a manner that the frame can be readily brought to the desired locality and position, and that by the action of the steam-cylinder the saw receives its desired

motion; it consists further in combining with each longitudinally sliding frame a series of rotary adjustable discs, in such a manner that the saw, together with the driving-pulley and feed-motion, can be set to any desired angle.

PAINTING GLASS TRANSPARENCIES.—The *Scientific American* gives the following receipt:—Provide a small muller and a piece of thick ground glass five or six inches square, to grind the colours on, also a small palette-knife and a few bottles to put the colours in. For a red colour get a little scarlet lake, and for a blue a little Prussian blue. For green use purified verdigris ground with a quarter of its bulk of gamboge; and for brown use burnt umber, and for black burnt sienna black. These colours are truly transparent. Having all these colours ready, grind them in the balsam of fir mixed with half its bulk of turpentine; mastic varnish will do very well, but the balsam is the most beautiful. To coat the glass black round the painting, dissolve asphaltum in turpentine and mix with lamp-black. When the colours are all ground they must be put in separate bottles and sealed, and when they are to be used, a little bit is taken out at once on a piece of glass, just as much as is needed at once, as it quickly dries. If the colour is too thick, it must be diluted with turpentine. To paint glass sliders, the subject must be designed on paper, and the paper put under the glass and the glass painted above it according to the design on the paper underneath.

THE excavations on the Cheviot Hills have led to the discovery of the very perfect remains of several huts composed of blocks of the basaltic stone of the district. They belong to a very remote period of British history. Remains of beads and other glass ornaments, flint arrow-heads, and broken pottery, have been recovered during the works. Remains of iron slag have also been discovered, which appears to prove that the smelting of iron was understood by our Celtic forefathers at a far earlier period than is generally supposed.

THEATRICAL architecture has been busy of late. We noticed the other day the erection of a new theatre of important dimensions at Bath. At Paris, half the principal theatres have been recently either rebuilt or restored. The Opera is the last, the new walls of which are rapidly rising. And now the Germans seem to be catching this rage for theatre building; and in spite of political difficulties, and a national dearth of money of almost alarming character, a new Hofburg theatre is to be immediately erected at Vienna, on the site at present occupied by the Mülker-bastei.

A FINE bronze statue has lately been dug up at Pompeii.

A CURIOUS leaden cylinder has been found by some workmen at Chester, supposed to be of Roman origin. It contained human bones, burnt; was about 18 in. high, and 7½ in. diameter; it was half an inch thick at the bottom; the sides were welded together without solder, and the top closed by forcing in the sides.

ARCHITECTURE arose from the combination of sculpture with construction. *Building* may be older than sculpture, but sculpture combined with building produced architecture.

NOTICE TO CORRESPONDENTS.

IN the execution of the Plates which form our Illustrations, we hope always to have the advantage of the designs of the Architects whose buildings we represent. We also invite those gentlemen, in every instance, to communicate both with our artists and ourselves during the progress of our drawings, and we shall always be anxious to secure their approval for every illustration on its completion.

The lithographs contained in the present Part have all been executed from the architect's drawings. Their accuracy may be depended on, and they will doubtless be preserved and valued as faithful pictures of interesting and chaste examples of the street architecture of London in the Victorian age.

All communications for the Editor to be addressed to the care of DARTON AND HODGE, Publishers, Holborn-hill, E.C.

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